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Therapeutic Gazette.

Whole Series, Vol. XIX. | DETROIT, MICH., PHILADELPHIA, PA., | July 15, 1895. | Third Series, Vol. XI. No. 7.

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Original Communications.

THE PROPHYLAXIS AND TREATMENT OF ECLAMPSIA.

READ BEFORE THE AMERICAN GYNÆCOLOGICAL SOCIETY, BALTIMORE, MAY 29, 1895.

BY EDWARD P. DAVIS, A.M., M.D.,

Professor of Obstetrics and Diseases of Infancy in the Philadelphia Polyclinic; Clinical Professor of Obstetrics in the Jefferson Medical College; Visiting Obstetrician to the Philadelphia Hospital, etc.

IN the *American Journal of the Medical Sciences*, February, 1894, in a paper entitled "The Toxæmia of Pregnancy," I drew attention to what seemed to me the salient features of the diagnosis of threatened eclampsia. Further experience has confirmed my belief that eclampsia is the result of a complex irritant poison, which is produced not only by failure of excretion by the kidneys, but also by failure in the action of the liver, the skin, the lungs, and the intestines. It is my purpose in this paper to illustrate this fact by reference to clinical data.

If a toxæmic condition is the cause of eclampsia, it is reasonable to expect in eclamptic patients that symptoms of toxæmia, and especially those connected with the nervous system, should play a prominent part. One of the most striking of these is mania, and its occurrence as a pre-

cursor of eclampsia is well illustrated in the following case:

Mrs. A. S., aged thirty-eight years, had borne two children, and had one miscarriage. Her children are living and healthy. The labors were normal, and the mother made a good recovery after them. Her third confinement was expected about the 20th of January, 1895. The patient was the wife of a skilled workman, living in plain but comfortable circumstances. With the exception of a slight cough, she had been in ordinary health until January 8, when she suffered with intense headache and disturbance of vision. On the following morning she prepared her husband's breakfast as usual and also the noonday meal for her children. About 1 P.M. she suddenly became maniacal, rushed up two flights of stairs hastily, and attacked her sister-in-law. She was finally placed upon a bed, when convulsions supervened, lasting for some time. She regained consciousness, but at 4 P.M. became comatose, and was taken in this condition to the Jefferson Maternity at 7.30 P.M. Upon admission, she was entirely unconscious, the os uteri completely dilated, no uterine contractions being present. The pupils were equal and contracted, the eyes slightly turned towards the right, loud râles heard over both lungs. The pulse was rapid. As soon as I saw the patient I delivered her of twins, the first by version, the second by forceps. Neither child could be resuscitated. One had been dead several hours, the other but a short time. Both children were at term, one weighing five pounds thirteen ounces, the other six pounds five ounces. After three hours of vigorous treatment, consisting of hot packs, copious enemata, the administration of calomel, and, hypodermically, digitalis and atropine, the mother's urine, drawn by catheter, showed but slight traces of albumin; specific gravity, 1020; reaction acid; percentage of urea, 1.3. The patient died four hours after admission. The post-mortem examination was made on the following day, when the body was found fairly nourished. It was noticed that the serous membranes were very dry. The right heart was distended and flabby; the left empty. The lungs were markedly congested. The cortex of the kidneys showed fatty change, upon which had been grafted an acute process. The surface of the kidneys was granular. Considerable hemorrhage in the retroperitoneal connective tissue had occurred. The uterine and ovarian veins of the right side were enormously dilated and varicose. The uterine muscle was firm, the cavity of the womb being clean and dry. Slight hemorrhagic extravasations were found in the stomach. The liver was soft, and its surface mottled and dark in color. It was somewhat enlarged. Post mortem examination of the bodies of the children showed that no efforts at respiration had been made, the children perishing from asphyxia *in utero*. The placentæ showed areas of infarction and a friable condition of the vessels.

A review of this case with its post-mortem findings furnishes a clinical picture of death from irritant poison. The legs and feet of the patient were not œdematous, the symptoms of Bright's disease or acute kidney failure were lacking, while the sudden mania, followed by convulsions, coma, and death, resembled far more a case of ptomaine-poisoning than death by uræmia. The intense pulmonary congestion, dry, serous membranes, enlarged, mottled, and softened liver, injected and granular kidneys, distended right heart, and diseased placentæ complete a suggestive and instructive picture.

That such a condition is not invariably fatal is illustrated by the case of J. S., a colored woman of uncertain habits, who gave a history of having previously suffered from enteric fever, grip, pleurisy, and pneumonia at various times. She had borne one child previously. During the present pregnancy she had suffered from epistaxis, swollen legs, less painful at night, and disturbance of vision, with headache. She sought relief at the Jefferson Maternity, where, upon examination, it was found that liver dulness extended three fingers'-breadth below the ribs. The tongue was furred and coated. The pulse was wiry, its tension being greatly increased. Dulness was found beneath the clavicles, with prolonged expiration. The patient suffered from chronic constipation, with anorexia. The urine was highly albuminous, the percentage of urea was below 1, and epithelial and granular casts were present. The patient was treated by hot packs, with purges with calomel and salines, rest in bed, and milk diet. She improved and became insubordinate, and was discharged. She shortly afterwards came under my care at the Philadelphia Hospital, in the same condition in which I first saw her. Labor was induced, a very guarded prognosis being given, with a fatal prognosis as regards the child. After the first bougie was inserted in the uterus, the percentage of urea fell to .76, followed by two convulsions. Labor, however, supervened, and the patient was delivered spontaneously of a still-born fœtus. The percentage of urea shortly afterwards rose to 1.5. The placenta showed mul-

tiple infarcts. The patient was treated by the hot pack with free purgation and the plentiful use of water, and made a gradual recovery. The liver dulness diminished slightly, the condition of the urine became better, and she was able shortly afterwards to leave the hospital. It is interesting to observe that, following labor, the amount of urine increased from thirty-three to forty-two ounces, in the next twenty-four hours dropping to forty ounces. This was under the influence of calomel and the use of the hot pack.

In this patient's case the enlarged liver, sluggish intestine, severe headache, and anorexia, with great irritability of the nervous system, illustrated well the presence in the body of an irritant poison.

While the cases described illustrate the effects of profound toxæmia in pregnant women, in patients in comfortable circumstances and under intelligent care the physician will find that much of the suffering which pregnant patients complain of, referred to the nervous system, may be traced to a toxæmic condition more or less pronounced. In women of sensitive nervous system, premature labor is not an uncommon result of partial toxæmia. As an illustration of this, the following case is cited:

Mrs. L. J., multigravida, third pregnancy, suffered from habitual constipation following an operation for hemorrhoids. When first examined she was between seven and eight months advanced in pregnancy, in excellent general health, the excretory functions being well performed. She was accustomed to habitual overexertion, and early in the ninth month of pregnancy she complained of fatigue, restlessness, and severe uterine contractions, which led her to fear that labor was at hand. Examination of the size of the uterus and the position of the child showed that pregnancy lacked between four and five weeks of its normal duration. The patient, however, was uncertain regarding the time of the last menstruation, and believed her confinement to be due. A careful examination of the patient showed, however, that her processes of excretion were performed less perfectly than had been the case. The specific gravity of the urine was 1018, its reaction acid, it contained no albumin, but the percentage of urea was .8 of one per cent. Digestion was poorly performed, and the action of the intestine was sluggish. She was confined to her bed, given a carefully selected diet, the action of the liver stimulated, and the bowels freely moved. One week after this treatment was instituted the specific gravity of the urine was 1030; it contained an abundance of urates, the percentage of urea being 2.5. Although the symptoms of labor were so pronounced as to cause the patient to summon her nurse on one occasion, uterine contractions gradually ceased, and the patient went four weeks longer in pregnancy, being subsequently delivered in normal labor. During the last four weeks overexertion was strictly avoided, her diet was carefully regulated, and a close watch kept of the excretory processes.

Œdema and a trace of albumin and also of sugar, while pathological during pregnancy, may yet be present without threatening eclampsia. These phenomena are of distinctly minor importance if the percentage of solids in the urine indicates that excretion is proceeding properly.

Mrs. L. E., aged thirty years, primigravida, had taken little exercise during her pregnancy, had suffered from constipation, and was excessively fond of sweets. She is a stout, heavy woman, with justo-major pelvis. Her feet and legs were greatly swollen, the œdema extending up the thighs to the groins and labia. General anasarca was present, the lower extremities being more swollen than other portions of the body. The patient, however, while complaining of salivation and an abnormal taste in the mouth, did not suffer from headache, slept well, and had good appetite. The examination of the urine showed the specific gravity, 1020; sugar and albumin present, with an abundant secretion of urea, 2.7 per cent. This patient went to term and was delivered by forceps, her labor being complicated by œdema and hæmatoma of one of the labia. She is now convalescent and has never had symptoms of eclampsia.

Toxæmia is occasionally associated with fæcal impaction in a very plain and instructive relationship. The symptoms of this condition are characteristic headache and malaise and also a rapid and feeble pulse. By physical examination the large intestine is found distended with masses of hardened fæces through either a portion or all of its extent. This condition is well illustrated by the following case:

Mrs. F., aged twenty-eight, multigravida, was admitted to the Jefferson Maternity in the ninth month of pregnancy, seeking relief for headache, nausea, and prostration. Upon examination, an impacted colon was plainly discernible, the patient stating that she had had no free bowel movements for more than a week. Her temperature was 100.5° F.; her pulse, 124. She could not sleep, had little appetite, and complained of headache, impaired vision, and general prostration. An

examination of the urine showed its specific gravity 1006, albumin and sugar being absent, the percentage of urea present being .5 of one per cent. The patient stated that she had suffered in a similar manner in former pregnancies, but never so severely. She was at once put to bed and treated actively by hot packs, purgatives, and restricted diet. Under this treatment she experienced marked relief; her headache gradually ceased; she was able to sleep. Her appetite partially returned, and her improvement was so pronounced that she left the Maternity and returned to her home. The specific gravity of her urine increased steadily under the treatment pursued, while the percentage of urea rose from .5 of 1 per cent. to 1.1 per cent. By high enemata it was possible to partially empty the impacted colon, but as the patient would remain but four days in the Maternity, a thorough emptying of the bowel was impossible. This patient had been treated at her home by sedatives addressed to the nervous system, the physician in attendance supposing that her headache was a purely nervous phenomenon.

In my first series of eighty-four cases, in which five hundred and sixty-four examinations of the urine were made, I found the average percentage of urea present before labor to be 1.4 per cent. After labor, in healthy women, an increased excretion of urea is observed for several days following parturition. In a second series of sixty-five cases, in which one hundred and ninety-six examinations of the urine were made before labor, the same results have been observed as in the previous series. The most pronounced cases showing the effects of toxæmia upon the nervous system without the occurrence of eclampsia are observed in women of highly nervous temperament, and often highly educated and intelligent women. In these patients the gradual development of malaise, headache, sleeplessness, nervous irritability, melancholia, apprehension of approaching confinement, with gradually diminished excretion from the intestines and kidneys, form a clinical picture which should not be neglected by the practising obstetrician. If such a case is patiently studied, it will be found that the symptoms associated with the nervous system result from diminished excretion and the irritant effect of retained toxins. No greater mistake can be made than to treat these patients by the administration of bromides, as is often done. Rest and increased excretion have invariably, in my experience, resulted in the disappearance of the symptoms.

So far as the study of the urine is concerned, we yet lack for practical purposes a clinical index of the amount of solid matter excreted. It has been my custom to use the percentage of urea in a given specimen, whose specific gravity and quantity are known, as an index of excretion. I have found latterly the simple apparatus furnished by Squibb most convenient and efficient. His apparatus, familiar to all, does not require the use of bromine, which is so disagreeable to the investigator. Some prefer to take the coefficient 2.33, and obtain the amount of solid matter in a given specimen by multiplying the last two figures of its specific gravity by this coefficient. It is urged by those who prefer this method of study that urea in itself is not a dangerous ingredient of the urine, and that under a vegetable diet it may sink to a very low percentage, which would not fairly indicate the condition of the patient. Undoubtedly a more thorough way of studying the patient's excretory processes is by using both methods, and, in addition, putting the patient upon a fixed diet-list, so that an accurate idea of the ingesta may be obtained, as well as a knowledge of the excreta. Such a diet-list for pregnant patients should consist of the lighter sorts of meat, fish, oysters, birds, lamb, and mutton, to be taken in moderation, with an abundant supply of fresh fruit, fresh vegetables, stale bread, and water taken freely between meals. For restless patients who excrete badly, the warm bath at night will often assist greatly in procuring sleep. Light flannel next the skin, entire absence from constriction about the waist, the prolonged use, if necessary, of gentle laxatives, such as cascara, with plenty of fresh air, and avoidance of overexertion usually suffice to keep these patients in comfortable condition. As with puerperal sepsis, so with toxæmia and eclampsia, they are best treated by preventing them and recognizing the conditions which favor their development. This requires, however, a careful and intelligent supervision of pregnant patients, and the profession will find it necessary to educate many of their patients in the belief that such medical care is necessary and deserving of adequate compensation.

In the presence of eclampsia two indications are paramount. The first is to cause prompt, thorough, and copious elimination by every possible means. The hot pack, free purgation, and saline transfusion are of the greatest importance. To be avoided are sedatives, which hinder excretion and depress the cardiac and respiratory centres. In cases where apoplexy

is threatened and a heavy, full pulse indicates bleeding, such a procedure is justifiable.

It is rarely the case that a patient suffers from profound toxæmia and eclampsia without the beginning of labor, as a direct result from the stimulation of the uterine nerves which retained toxins furnish. Taking advantage of this conservative process, rapid delivery is indicated so soon as it can be accomplished without positive and severe injury to the mother. The interests of the fœtus will be best served by rapid delivery, when the familiar fact is taken into consideration that the same poisons which threaten the mother often kill the child.

It is not my purpose to weary you with a review of recent literature upon this subject. Recent studies in medicine, notably those of Hughes and Carter, with the familiar investigations of Bouchard, call attention to the fact that the first symptoms of toxæmia are often associated with the nervous system. The recent studies of Thomson and Herman, of London, call attention to the two different forms of visceral disease present in these cases. Woyer's interesting report of eclampsia in mother and child, with post-mortem examination in the child and examination of its urine, illustrates in a most interesting manner the fact that toxæmia is fatal in the same way to mother and child. It has been my purpose in thus addressing this Society to urge as strongly as possible the necessity of a thorough study of pregnant patients, and to draw attention to the fallacy of the belief that a pregnant patient is not in danger unless the urine is highly albuminous and œdema is pronounced. While in physiological patients pregnancy is a physiological process, yet so few of our patients are in perfect health before pregnancy or during this time, that the period of pregnancy requires watchful care, while the study of the condition of the mother during gestation affords a most interesting and instructive field of pathological research.

250 South Twenty-first Street.

TAKA DIASTASE.

By Ferdinand Lascar, Ph.Gr.,
Pathologist to the Demilt Dispensary, etc.

IN the human system a continued waste takes place which it is necessary to provide for, and to this end man partakes of food which must contain the elements for this purpose. To bring such food products into proper form, so that they can be assimilated and taken up in the system, the digestive organs perform their functions, and these are of a mechanical and chemical order. The food needed is both animal and vegetable in nature, the latter forming by far the greater and more important part. It can truly be said that upon the proper digestion of his food, man's health, happiness, and very life depends, and progressive science has fully demonstrated the unerring truth of this Any irregularity or fault in the process of digestion very soon becomes manifest, and dyspepsia, malnutrition, and ill health follow. As the food man partakes of is twofold, so is the process of digestion a twofold one, animal and nitrogenous foods needing an acid, while vegetable, starchy foods need an alkaline process to bring them into a soluble form ready for assimilation. The general idea about faulty digestion is that the stomach performs its duties improperly. While this, in very many instances, is undoubtedly so, the fact is, nevertheless, that in the greater number of cases of impaired digestion improperly performed processes of other organs are at the bottom of the evil in failing to properly convert the starchy food partaken of.

The changing of amylaceous food into dextrose and maltose is the beginning of digestion. All will have observed that bread, crackers, or potatoes, not being sweet in themselves, very soon become so when masticated and thoroughly mixed with the saliva in the mouth, and that their taste becomes sweeter the longer this is continued. This sweet taste is due to the conversion of the hydrated starch by the action of the saliva upon it, the saliva containing an enzyme called ptyalin, which, by its presence, splits up the starch into soluble products which I will mention later on, and this splitting-up process of the starchy food even continues after it has left the stomach. Animal foods needing the acids which are found in the stomach are digested there, but acids materially interfere with the action of enzymes which cause the conversion of starch, even destroying such action altogether. For this reason it seems practically incorrect to say that the conversion of starch continues after it leaves the mouth; but nature has provided against a too soon interference of acids, because it is now well understood that acid, especially hydrochloric acid, is secreted in the stomach a considerable time after the food has arrived there, and this may be one of the reasons why the converting of starch continues after it has left the mouth.

Since medical science has thoroughly grasped the philosophy of digestion, it has been the aim

by artificial means to supply the enzymes which digestion calls for when they do not appear to be present in a sufficient quantity or are secreted in less potent form by the digestive organs. Science has succeeded fairly well in supplying gastric and pancreatic ferments when nature lags behind; but our success has so far been only a very partial one in supplying starch-converting substances, and for this reason a new and seemingly valuable discovery in this direction at once becomes interesting.

That diastase has an identical action with ptyalin upon starch is a fact long known, and for this reason the diastase contained in malt has been employed for this purpose. Diastase is contained to a lesser or greater extent in the different extracts of malt, and in minute quantities also in fermented malt preparations. In the latter the diastatic action, however, is generally totally destroyed by the acids present. Even in the best extract of malt there is only a limited and variable amount of diastase present; and while the extract of malt will continue to play an important *rôle* as a dietetic agent, its utility as a starch-converting agent will always remain a limited one. From time to time pure diastase has been offered to the profession, but none has so far proved of a sufficient potency to recommend itself to general use. Great progress in this direction is the discovery of Mr. Takamine, a chemist of no mean ability, who acted as one of the commissioners of Japan at the Cotton Exhibition in New Orleans several years ago. At that time he showed me an extract of malt, as manufactured in Japan, very rich in diastase and nutritive properties, and which I have mentioned in a paper on the diastatic and nutritive properties of malt extracts, published in the December number, 1891, of the *Epitome of Medicine*. In that paper I warned against too great heat in the manufacture of malt extracts, as heat impairs, and even is liable to totally destroy, the diastatic action. The avoiding of all undue heat in preparing diastase may be one of the reasons why the diastase which is now manufactured by Parke, Davis & Co., under Mr. Takamine's discoveries, is so perfect in its action in converting starch into maltose and dextrose. His product is a dry powder similar in appearance to some I received from a reputable German firm years ago, but is vastly superior in potency. Since the receipt of this German preparation I have frequently had occasion to experiment with various diastases, some being named vegetable ptyalin, but in no instance have they come up to the desired standard, and failed to fill the void felt for an enzyme which will accomplish what the enzyme of saliva in a healthy individual does accomplish.

In comparing notes of experiments lately conducted with taka diastase, other available diastases, and different extracts of malt, I find that the claim of the taka diastase that it will convert a hundred times its own weight of starch into a soluble state is well authenticated, for I have succeeded in converting even fifty per cent. more of starch than is claimed for it. Another point in favor of taka diastase above other similar products is the quickness of its action upon starch, for the action is almost instantaneous. To convert one hundred parts of starch into a soluble state by the action of one part of taka diastase, under proper conditions, it takes only four minutes until neither iodine test nor the microscope can detect unconverted starch. The product of converted starch with Mr. Takamine's taka diastase is to a great extent maltose. Compared with the time required by the best extract of malt to convert starch, this is certainly an excellent showing, for it took the best malt extract between seven and eight minutes to convert its own weight of starch into a soluble state, while with some other extracts of malt it took fifteen, twenty, and thirty minutes to partially accomplish this end. Tests with Fehling's solution to ascertain in the converted starch products the amount of contained sugar therein were equally favorable to taka diastase.

In converting starch into a soluble state by the action of diastase, the rearranging of the molecules of starch is understood to be as follows:

Starch ($C_{12}H_{20}O_{10}$) 10 plus water, H_2O, are first formed into erythro-dextrose and maltose.

$$(C_{12}H_{20}O_{10})\ 9 \text{ and } C_{12}H_{22}O_{11}$$

By the continued action of diastase further hydration of the erythro-dextrose takes place.

The erythro-dextrose further splits up into erythro-dextrose-β and maltose, the ultimate result being a small amount of dextrin (anchro-dextrose) and eight or nine equivalents of maltose. Since Leuch's discovery of the specific starch-converting property of saliva and its ptyaline, we have lacked an agent of sufficient potency to accomplish what good healthy saliva does, and, for the first time, we find in taka diastase a substitute of undoubted worth, which, even in the presence of a minute quantity of acid, does not cease to be potent. The ptyaline in saliva is present there in a neutral or weak alkaline state, and for this reason it

suggests itself that diastase, being an analogue with the former, acts also at its best in such a state, and is incompatible with acids. I employed in the greater number of my experiments with diastase carefully washed arrow-root,—a perfectly bland and neutral starch; but I found that starches giving a slight acid reaction on blue litmus were equally well converted by taka diastase. In testing diastase as to its potency, I would recommend that the iodine as well as the copper tests be employed, and that undue employment of heat under all circumstances should be guarded against, as heat, as already mentioned, destroys the action of diastase.

Taka diastase being a dry powder, tasteless and of no perceptible odor, can be given in very small bulk, and for this reason I think it will prove itself of value in infant feeding, where it is desirable to give starch-containing foods, provided said food would easily dissolve and the infant's saliva could be relied upon to perform that function. That the new diastase is destined to become a favorite with the profession I have no doubt, having acquainted myself with its potency in converting starch in a minimum of time into a form ready for absorption by the system, and I think it will be found the very remedy for which we have waited so long.

A PLEA FOR THE COLD TUB-BATH TREATMENT OF TYPHOID FEVER.

READ BEFORE THE MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA, MAY 21, 1895.

BY JAMES TYSON, M.D.,
Professor of Clinical Medicine in the University of Pennsylvania.

WHEN asked by the chairman of the Business Committee of the State Medical Society to prepare a paper which should not occupy more than ten minutes, on the treatment of typhoid fever, I responded somewhat eagerly, for the reason that while I have no treatment to propose which can any longer be considered recent, I have been anxious for an opportunity to give emphasis to a method of treatment which, while it has received the acknowledgment of the large majority of hospital physicians, has, for various reasons,—some of them quite potent,—failed to come into that general use which its efficiency demands for it, and I have thought that an opportunity would be presented here of reaching many who, by reason of their residence out of the larger cities, have not had their attention called as forcibly to its superior advantages as needed to secure its more general adoption in private practice. Further, I am able also to show a means by which the treatment is bereft of one of its most serious inconveniences. I allude to the Brandt bath method of treating typhoid fever. I have become so satisfied from my personal experience with this method that it without doubt so greatly surpasses any other in the results attained by it, that I feel impelled to do what I can to extend its use. Without occupying unnecessarily the time of the Society in the consideration of details, I may say that the effect of the treatment has been to reduce the mortality of the disease from a minimum of ten to fifteen per cent., by other methods, to at least as high as 3.9 per cent., based on general statistics, these figures being obtained by Brandt from twenty-three German and French sources, with five thousand five hundred and seventy-three cases, including many imperfectly managed; while of cases treated in strict accordance with his method by Brandt himself and others up to January, 1889, out of twelve hundred and twenty-three cases, only twelve died, a mortality of one per cent. only. In the German Hospital at Philadelphia sixty-four cases were treated by Wilson, Trau, and Wolff, without a single death. The mortality of the Johns Hopkins Hospital, Baltimore, since the introduction of the cold-bath treatment, has been 7.1, as reported by Osler.

The method of carrying out treatment, as pursued by different physicians, is not always the same, though I think it may be said to be essentially so. My own plan, pursued for the most part in the Hospital of the University of Pennsylvania, has been as follows: Until recently I have been in the habit of waiting for the diagnosis, but of late have become satisfied that time is thus unnecessarily lost and the full advantage of the method not attained by such a course, while no possible harm can result to the patient with fever who may, by mistake as to diagnosis, have been treated for a short time with baths.

It has been our practice to have in the wards a movable tub, which is wheeled to the bedside and kept there, unless needed for another patient, during the treatment of the illness. It is filled with water at a temperature of 70° F., as a convenient figure and sufficiently near the 68° F. laid down by Brandt himself. In the summer season the temperature of the water from the city tap is often a good deal higher than this, and it has to be cooled down by means of ice. The temperature of the patient is taken on admission, and whenever it reaches 102.2° F. he is put into the tub. If moist, his body is dried off. If he has not recently emp-

tied his bladder, he is requested to do so. He is then divested of all clothing, but a sheet is thrown loosely around him, and if the bath-tub is made of the right height (it is generally made too high), he has simply to sit upon the edge of the bed and swing his legs into it; then, with very slight assistance from the nurse, the rest of the body is moved into the water. It very frequently happens that the patient is quite strong enough to make all the required effort himself, and is in no way injured by it. Thus submerged, a compress wet with ice-water is placed upon his head, or, less frequently in our practice, water at a lower temperature is poured upon the head and shoulders. The patient remains in the bath fifteen minutes, during which time he is thoroughly rubbed, if possible, by two attendants, and encouraged also to rub himself everywhere excepting the abdomen, which is left untouched for evident reasons. While in the bath a little wine or whiskey and water is sipped, but I do not consider this an essential part of the treatment. At the end of the fifteen minutes he is removed from the bath and dried.

While in the bath the patient shivers, his teeth chatter, and he has the appearance often of being very uncomfortable; indeed, probably is so; but the attendants must not allow themselves to be disturbed by this and induced to change the course directed or remove him from the bath, but to encourage him by word and manner. Does it ever happen that it is necessary to take him from the bath? In very rare instances, where there is a general asphyxiated appearance of the skin, and there is an evident feebleness and great frequency of the pulse, it may be, although this is such a rare circumstance that I do not remember ever to have found it necessary in my practice. If it should happen after the patient is removed that there is delay in securing a reaction, artificial heat—hot-water bottles or cans—may be applied to the extremities until warmth is restored.

The patient being removed from the bath at the end of fifteen minutes, in three-quarters of an hour—that is, one hour after the temperature which determined the bath was originally taken—it is again taken, and if the thermometer reads 102.2° F. the bath is repeated. If the temperature is 102° F., it is again taken in half an hour; if below 102° and above 101° F., it is taken in an hour; if below 101° and above 100° F., it is taken in two hours; if below 100° F., it is not taken again for three hours; but whenever it registers 102.2° F. the bath is repeated, and so on until the temperature is permanently below the bath-point.

While much less effort than might be supposed is necessary to carry out this treatment, it is still true that, with provision thus far made and easily available, it is a considerable tax on the attendants, and so difficult has it seemed to carry out the tub-bath treatment in families that it has so far failed to secure general adoption. By means of an improvised tub invented by Dr. A. H. Burr, of Chicago, and which I show you to-day, a very large part, if not the whole, of this difficulty, is removed,—a difficulty which increases with the size and weight of the patient. Dr. Burr's tub consists, first, of a large rubber sheet, with rings attached near its margins by elastic tapes; second, of a light wooden crib, with fastenings along the lower rail to hold the sheet. This frame folds by two movements into a compact bundle. The accessories are a hose, with metal yoke for a siphon, and a bath thermometer. In using, the sheet is first slipped under the patient, brought up over the pillow, and tucked up alongside of the body. The frame is then unfolded and placed down over the patient, resting on the mattress, covered by the rubber sheet, and surrounding patient and pillow. The edges of the sheet are then drawn up and over the top rail of the crib down to the lower rail, and fastened by its rings. This completes a light and perfect tub, capable of holding twenty gallons of water. It can be emptied by siphon in four minutes.

This is a ten-minute paper, and it is not expected that much time should be expended upon theorizing. The immediately apparent effect of the bath is to reduce the temperature of the body. A good deal of thought has been spent in theorizing as to its mode of action, and especially to prove that it is something more than a reduction of temperature that is accomplished. Notwithstanding this, no definite conclusion has been reached; nor does it much matter. This much, however, seems to me plain, that if it is anything else than the high temperature which constitutes the danger in the vast majority of the cases of typhoid fever, it is something which is at least associated with such temperature, and something which disappears with the fall of the temperature. The temperature, therefore, becomes a certain index of its presence or absence, and it does not much matter for the purposes of cure what that something is. While I have read carefully much that has been written on this point, I confess that I have not been dispossessed of the idea that it is high temperature itself which, by its long-continued

operation, produces the unfortunate results in the proportion of cases named.

A word or two may, however, be said of further appreciable effects of the bath to show that it is in itself incapable of producing harmful results. It is observed that, so far from the heart and pulse being weakened, they are strengthened, as indicated by the improved action of the heart, the distinctness of the first sound, by the increased strength of the pulse at the wrist and its diminished frequency. The effect upon the aeration of blood is also beneficial, in that the respirations are deeper and in a short time have grown less frequent. I am not clear in my own mind about the effect and necessity of friction, although most of the advocates of the plan deem it a matter of great importance. It requires very persistent and thorough rubbing to bring the blood to the surface under the circumstances. It certainly does no harm, while it entertains the patient, and should be practised until we learn some good reason why it should be discontinued. The digestion remains perfect, there is little or no diarrhœa, and tympany is infrequent. The dry tongue disappears, there is no delirium, and the brain remains clear.

A word only as to the diet of patients under this treatment. As in other forms of treatment, milk is pre-eminently the most suitable nourishment. The quantity must vary with circumstances, but my practice is to give from 4 to 6 to 8 ounces of plain milk every two hours, which is boiled if there is a tendency to undue looseness of the bowels, or peptonized if this treatment fails to correct such a tendency. If, on the other hand, as is not infrequently the case, there should be a tendency to constipation, the milk may be alternated with the animal broths for their laxative effect. I do not consider myself required to omit symptomatic treatment for loose bowels or any other symptoms which may demand it, but in point of fact no other treatment is required in the vast majority of cases. The whole effect of treatment, as summed up by Brandt himself, is to reduce the ordinary picture of typhoid fever to nothing more than a moderate fever, with a mild bronchial catarrh, enlargement of the spleen, the rose rash, and the infiltration of the intestinal glands. As well stated by James C. Wilson, "Severe enteric fever is converted into mild, the mild to a still milder form," and, I may be permitted to add, *all this without the use of drugs*.

As I already have said, this treatment seems to me to be the very best for typhoid fever. It must be admitted, however, that it is not invariably successful, and I have myself lost cases under its use. The cases which have terminated thus unfavorably have been where perforation has taken place, and I have, so far as my own experience goes, no reason to believe that the number of these cases is rendered fewer. Yet I am told that Brandt himself holds that if the treatment is sufficiently early adopted, —that is, before the fifth day,—an effect is produced in diminishing the frequency of perforation and of hemorrhage, both of which have occurred in my practice. Much experience will be necessary to settle these questions. Up to January 1, 1895, I had treated thirty-one cases (twenty-nine at the University and two at the Philadelphia Hospital), of which one died of peritonitis after perforation, making a mortality of three and a half per cent. The case of perforation was admitted at an advanced stage. Since the 1st of January I have added only two cases, of which one—a desperate case—unfortunately died of perforation on the forty-second day, after sixty-seven baths, the last on the twenty-second day. This has increased my mortality to six and one-third per cent. During this period, from various causes, nine cases were not treated with baths; of these, three died, or thirty-three and one-third per cent. In the year previous, before the bath treatment was started, I treated ten cases, with two deaths, a mortality of twenty per cent. The University cases included those only in my wards. Dr. Pepper had about as many.

It has been my practice to discontinue the baths when hemorrhage appeared, but with the Burr bath-tub this is not necessary, and if the temperature keeps up to the bath-point there is no reason why the bath should not be continued.

Whatever may be the difficulty in the general adoption of the treatment, none has ever been suggested which has stood the test of trial so long and so satisfactorily, and of all methods it alone has passed the stage of primary laudation. The number of baths required varies greatly. The smallest number has been four, the largest ninety-one, and some cases did not reach the temperature which is the condition of the bath,—102.2° F. These cases have invariably terminated favorably without any other treatment than suitable diet and good nursing. In severe cases with high fever, on the other hand, the baths have to be very much more frequent, and if they fail to bring down the temperature, the period of immersion may be somewhat prolonged, but never beyond twenty minutes. I do not adopt the practice, recommended by some, of keeping the

patient in until the temperature is down to a given point. In the first place it is not easy to take the temperature in the bath, while it often happens that there is a decided fall after the patient is removed.

THE TREATMENT OF NÆVUS.

READ BEFORE THE MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA, MAY 21, 1895.

BY H. R. WHARTON, M.D., PHILADELPHIA, PA.,
Demonstrator of Surgery, University of Pennsylvania; Surgeon to the Presbyterian, Children's, and Methodist Hospitals.

I DESIRE to call the attention of the Society briefly to the treatment of some of the various forms of vascular tumors known as angeiomata or nævi, and to emphasize the importance of the early treatment of these growths.

The varieties of nævus which are most commonly met with are: 1. The capillary nævus, which appears at or soon after birth, and consists of a small flat tumor, usually of a bright red color, slightly raised above the surface of the skin, made up of capillaries increased in size and numbers, and closely aggregated; this form of growth usually occupies a limited amount of surface. 2. Port-wine mark. Another form of capillary nævus known by this name is superficial, of a purple color, and usually involves a considerable amount of surface. 3. Venous nævus, which growth is more elevated than the capillary nævus, is of a purple or bluish color, may involve the skin or may be largely subcutaneous, is apt to become swollen or turgid upon the patient's crying, and the growth often presents cysts which contain blood. A small nævus at birth, if left to itself, will often grow rapidly and involve so great an amount of tissue that it passes beyond the reach of surgical aid, its growth and involvement of the surrounding tissues almost assuming the character of a malignant tumor. A growth which it was at one time perfectly possible to cure by the application of a drop of nitric acid, or by a trivial surgical operation, may increase so much in size and involve so great an extent of surface that its removal could not be undertaken with safety to the patient; on the other hand, a nævus may remain stationary for a long time, and suddenly may take on a very rapid form of growth. A case in point which illustrates this fact was that of a child who was brought to the Children's Hospital, in Philadelphia, who had a small venous nævus, about the size of the thumb-nail, upon the right cheek near the articulation of the lower jaw; operative treatment was suggested and refused, and the child was taken away from the hospital. The case returned some months afterwards, and it was found that the growth had extended from the original part and involved the neck and tissues of the right side of the face, and extended under the chin to the ear of the left side, involving also the mucous membrane of the lips and the gums. The child at this time was losing blood from several points of ulceration in the growth, and though the hemorrhage was controlled from these points for a time, by the use of the actual cautery, the patient ultimately succumbed to the exhaustion following the constant bleeding. This was a case in which it was perfectly possible to have brought about a permanent cure if the case when first seen had been subjected to the proper surgical treatment.

I think it may be laid down as a safe rule of practice that all forms of vascular growth in young children should be most carefully watched, and as soon as it is evident that the growth is increasing in size it should be promptly treated.

The treatment of capillary nævus which I have found most satisfactory is cauterization with nitric acid; a small stick of wood—a match-stick I usually employ—is dipped in nitric acid, and the end is then firmly applied over the whole surface of the growth until it presents a yellowish-brown appearance, care being taken to see that the application is thoroughly made to the edges of the growth; no dressing is applied, and in a short time a brown scab separates, leaving a red cicatrix, which, in time, bleaches and becomes white in color. One application of the acid, made in this way, is usually sufficient; but if it is found upon separation of the scab that any small portions of the growth have not been destroyed, these are cauterized in the same manner with nitric acid. Actual cautery, applied by means of a knitting-needle heated to a dull-red heat, or galvano-cautery, may also be applied to destroy this growth. Ethylate of sodium, applied by means of a glass rod, can also be employed, care being taken that the caustic does not come in contact with the healthy skin. Electrolysis is also highly recommended and often employed in the treatment of this form of growth. In the treatment of capillary nævus, from the ease of application and the satisfactory results obtained, the use of nitric acid, in my experience, applied as above described, is most satisfactory.

The port-wine mark is the least dangerous form of nævus, but it produces most deformity, although it does not tend to spread like the

other forms of these growths, but, as a rule, it involves a larger extent of surface and is not cured without a considerable amount of scarring. The treatment of port-wine mark is by multiple scarification, a number of minute incisions being made into the growth, and the contraction following these incisions tends to obliterate the vessels. Electrolysis is at the present time also employed with satisfactory results in the treatment of this affection.

In the treatment of venous nævus various methods are employed, depending upon the size and situation of the growth. When the nævus is not too large, or the shape is such that excision can be practised, I prefer this method of treatment, care being taken to lose as little blood as possible during the operation, the employment of the elastic bandage or strap of Esmarch or simple rubber tubes may be used to control hemorrhage, their use being especially satisfactory where the nævus is situated upon the extremities. By excising the tumor it can be removed cleanly and completely, any bleeding-points can be secured temporarily by hæmostatic forceps, and the edges of the wound resulting can be brought together neatly by sutures, so that a linear scar only is left. When the gap left by the removal of the nævus is large, a plastic operation may be done by sliding flaps of skin to fill up the space, and even then the scar resulting is usually much less marked than when some of the other methods of treatment are employed. We meet with many cases of nævus which, either from the extent of surface which they involve, or from their shape, or from the position in which they are located, could not be treated by excision, principally on account of the loss of blood which would necessarily follow this operation; in such cases we have to resort to the use of the ligature, actual cautery, or electrolysis. In a small venous nævus, where it is decided to employ the ligature, it is best done by passing one or two harelip pins under the growth, and a needle armed with a double ligature is passed under the tumor; the mass can then be strangulated in two sections by firmly tying the two ligatures. Where the nævus involves a large extent of surface and is of irregular shape, the use of Erichsen's ligature, which strangulates the growth in a number of sections, is most satisfactory. The objection to the use of the ligature in the treatment of nævus consists in the fact that the strangulated mass necessarily sloughs, and upon the separation of this a large surface is left, which has to heal by granulation, and a certain amount of scarring always results.

In that form of venous nævus in which a small portion of the growth only involves the skin, and by far the larger portion is subcutaneous, we may resort in favorable cases to excision; but in the majority of these cases this operation, if the nævus be a large one, is so formidable that it is not wise to undertake it, and it is safer to attempt to cure the growth by means of a subcutaneous ligature. In applying the subcutaneous ligature to the nævus I usually use a large straight or curved needle, the point of which is ground off so that it is quite blunt. I then make a puncture in the healthy skin with a tenotome, a little to one side of the nævus, and pass the needle, armed with a long double thread of strong chromicized catgut, directly under the growth, and bring it out at a corresponding point on the opposite side; the thread is then divided so as to make two separate ligatures, the needle is threaded on the end of one of these ligatures, and the growth is surrounded by a subcutaneous ligature, the needle being entered at the point of exit of the first ligature and passed around the growth for a certain distance, then brought out through the skin, entered again through the same puncture, and so passed until it comes back again to the puncture which contains the other end of the ligature; the two ends are then firmly tied, and in this way the ligature is completely buried under the skin when it is tied. The remaining ligature is then passed around the other half of the growth in the same manner, and after it has been securely tied the surface is washed with a bichloride solution and a gauze dressing is applied over the growth. The vitality of the skin is usually not impaired, and, if the ligatures have not been too tightly tied, the nævoid tissue itself does not slough, but its growth is arrested, and very little scarring results. I have seen the use of the subcutaneous ligature in some cases followed by remarkably good results, where other forms of operative treatment seemed impossible.

I had a few years ago under my care at the Children's Hospital a patient who had a large subcutaneous nævus, involving a portion of the right cheek and a large portion of the side of the neck; in this case the excision of the growth would have been a very dangerous operation, as it involved the tissues very deeply, and I employed here a subcutaneous ligature, constricting the whole growth by five or six separate ligatures. This patient I had the opportunity of seeing two years after the operation, and then very little scarring existed and the cure of the growth was complete.

Electrolysis is at the present time highly recommended in the treatment of venous nævus, but to apply the treatment satisfactorily in the case of children it is necessary to use an anæsthetic, and a number of treatments may be required, thus requiring frequent anæsthetization, so that I am very decidedly of the opinion it should be only employed in cases of small tumors, where one or two applications only will be necessary to bring about a cure. In using electrolysis in the treatment of nævus the positive pole is applied by a flat piece of metal covered by chamois; the needle attached to the negative pole is introduced into the nævus, and should be passed into several parts of the tumor; three to eight cells will coagulate the blood, but fourteen to eighteen cells will be required to destroy the growth.

Actual cautery or galvano-cautery is especially useful in cases of nævus in which ulceration has occurred and where bleeding takes place. In such cases the hot iron or the point of the galvano-cautery iron may be introduced into the growth at various points; care should be taken that the iron or the galvano-cautery point is used at a dull-red heat. In using this method of treatment an anæsthetic is required.

Venous nævus, when small and situated in favorable localities, as upon the scalp or the forehead, having under it a bony basis, may be treated by pressure by means of a lead or cork button firmly strapped over the growth, or held firmly in contact with it by means of strapping or a bandage. This form of treatment takes a considerable amount of time, and there is often a very marked scar resulting. The treatment by injection of irritating chemical substances is often followed by severe sloughing, and sudden death has occurred from the injected fluid or clots passing into the general circulation. The substances employed are the tincture of chloride of iron, tannin, or carbolic acid.

A nævus involving the mucous surfaces may be treated in the same manner as that involving the cutaneous or subcutaneous tissues.

In conclusion, I would state that in small capillary nævi I very decidedly prefer the nitric acid treatment or the treatment by excision. In port-wine mark the treatment by multiple scarification or electrolysis offers the best chance of a cure with the least deformity. In venous nævus I prefer excision, if it is possible from the size, shape, and location of the growth; if this is not feasible, then the ligature or electrolysis or actual cautery should be resorted to.

NERVE SUTURE, WITH THE REPORT OF A SUCCESSFUL OPERATION FOR SUTURE OF THE MUSCULO-SPIRAL NERVE THREE MONTHS AFTER ITS COMPLETE DIVISION.

By Wharton Sinkler, M.D.

THERE is no difference of opinion as to the advisability of primary nerve suture, and the results which have been obtained from uniting the ends of a recently divided nerve have been so satisfactory that no one would hesitate for a moment as to the course to be pursued in the treatment of a nerve which had been severed within a short time. The only objection which has ever been made to the primary operation was the risk of tetanus, but that danger is now practically out of the question with the precautions which are taken to make every surgical operation aseptic.

The return of function in a nerve after suture is often remarkable. In the table of cases collected by Willard,* in twelve return of sensation was noted on the day following the operation. We must bear in mind, however, that there may be an error in supposing that sensation is conducted by the recently united nerve, for there is undoubtedly a vicarious action of the other nerves which supply the same region as the wounded nerve. In a patient of mine in whom Dr. W. W. Keen excised at least an inch of external saphenous nerve, there was never at any time loss of sensation in the region supplied by this nerve. The table of Willard, above referred to, gives the results in one hundred and twenty-three cases of primary suture. There were two deaths,—one from gangrene after sixty-five days and the other from causes not given. In but two was the result of the operation negative. In all of the remaining cases there is said to have been return of motion and sensation, more or less complete, in periods ranging from one day to one year.

The question of secondary suture—that is, when the nerve has been severed for weeks or, perhaps, years—is one upon which all are not agreed. In cases in which only a few weeks have elapsed after the division of the nerve has occurred, the point may be raised as to whether the nerve may not spontaneously unite by means of budding of the nerve elements from the proximate end of the nerve. The probability of this occurring is shown by the persistency with which nerves reunite when excision has been done for neuralgia. In later cases, then, there

* *Medical News*, October 6, 1894.

is the doubt as to whether the operation will be successful. Bowlby and others have shown, however, that in a large proportion of cases good results follow suture of nerves when months or even years have passed since the injury. In Willard's table of one hundred and thirty cases of nerve suture, eighty per cent. were more or less improved by the operation.

One point which is important to observe is the necessity for persistent and prolonged treatment of the paralyzed muscles by electricity and other means after the operation. As soon as the external wound has completely healed, mild electrical applications should be begun, and these should be continued daily or on alternate days for months, or until the return of the functions of the part.

An interesting feature in these cases is the fact that often there is restoration of motion in the paralyzed muscles before the electrical reactions become normal. Etzold and others have found that cerebral impulses are conducted along the nerve much sooner than those from an electrical current. In the case which I shall relate there was return of power in the paralyzed muscles at the end of five months, but after a year there is still absence of response to the faradic or galvanic current.

It is important, if possible, to bring the ends of the divided nerve together after freshening the edges. Even if the ends are separated a considerable distance, by freeing the nerve, it can be stretched to a considerable length without permanent impairment of function. In an operation for stretching the facial nerve, recently performed by Dr. Keen on a patient of mine suffering from mimetic spasm, a tension of ten pounds was put upon the nerve without paralyzing the facial muscles. Should it be impossible for any reason to bring the ends of the nerve together, then the insertion of a nerve-graft should be attempted.

It is most important during the healing process to keep the part at rest and to forbid functional use of the limb for some weeks. The nutrition of the muscles can be kept up with electricity and massage.

The following case is worth putting on record, as showing the value of secondary suture:

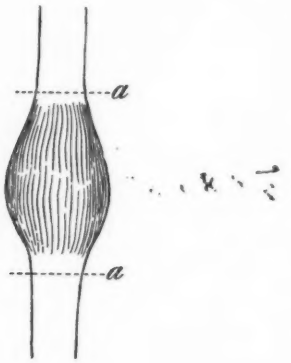
Frank C., aged twenty-six, married. His general health is excellent, but his habits are irregular as to stimulants. In the early part of February, 1894, he was stabbed in the left arm with a knife. When attacked, he threw up the left arm to ward off the blow, and the blade entered just above the elbow on the posterior and outer aspect of the arm, about three inches above the elbow. The wound was probably inflicted with a penknife, as the cicatrix in the skin was less than three-eighths of an inch in length. The bleeding was profuse at first, but was soon arrested without any surgical interference. He had some pain at the seat of the wound, but noticed no numbness or loss of power in the hand that night. The next morning the arm was stiff and sore, and he remembers that there was some stiffness about the wrist. The day following he found that there was loss of power in the extensors of the wrist and fingers, and there was a sensation of "pins and needles" in the thumb and forefinger. If the thumb or forefinger was struck, it caused considerable pain of the whole arm, and all movements were painful. The wound healed in a few days, and the acute pain in the arm subsided, but there was no improvement in the loss of power.

The patient was referred to me by Dr. Henry Sykes, and was examined by me on April 25, 1894. At this time there was complete wrist-drop of the left hand and inability to extend any of the fingers; the hand was swollen, and on the dorsum of the hand a well-marked hump. The distal phalanges of the fingers are extended by the interossei muscles. There is no loss of power in the flexors of the hand or fingers, but, owing to the total paralysis of the extensors, there is no power in the grip of this hand,—the patient cannot move the dynamometer one degree. Tactile sensation was preserved over the entire hand, with the exception of an area on the posterior and inner aspect of the thumb, extending from the carpo-metacarpal articulation to the last phalangeal joint. Sensation in this region was not entirely lost, but lessened. A pin prick was distinctly felt, but slight touches were not perceived. The muscles of the forearm were wasted and failed to respond to the strongest faradic current. To the galvanic current, marked reaction of degeneration was present. The intrinsic hand muscles were unaffected, and responded normally to electricity. After a consultation with Dr. W. W. Keen it was decided to suture the nerve, and on May 15, three months after the injury, the operation was performed.

The following is Dr. Keen's report:

"Operation, May 15, 1894. A vertical incision four inches long was made, the centre of it corresponding to the scar. The branch to the supinator longus was first seen, and the musculo-spiral nerve was found in the groove between the origin of the brachialis anticus and the supinator longus. The nerve was

markedly bulbous at the point at which it had been wounded. (See cut.) The bulbous por-



tion was excised and the two extremities stretched by the thumb and the finger. Neither end yielded very much, but they were elongated sufficiently to bring them into apposition. The two ends were then sutured with two fine silk threads. The specimen was given to Dr. Kyle for examination. The wound was then closed, a piece of gauze being packed in at each end for drainage. Forty-eight hours afterwards he had a rise of temperature to 101° F., with vomiting and a good deal of malaise. Inspection of the wound showed that the gauze had acted poorly as a drain. A stitch was cut at each end, the gauze removed, and a drachm of turbid fluid evacuated from each end. The wound then healed kindly, all the centre portion by first intention, the slight gaping wounds of the two ends by cicatrization, which was complete in two weeks."

Dr. D. Braden Kyle kindly made an examination of the excised portion, and has made the following report:

"Transverse and longitudinal sections were made. The bulbous or severed portion of the nerve was about three-quarters of an inch in its greatest diameter and one-half inch in its smallest diameter, the greatest diameter being in line with the trunk of the nerve. Macroscopically, the bulbous portion of the tissue appeared more fibrous than the portion of the trunk attached. On section, microscopically, it presented largely the same appearance. The microscopical appearance of the longitudinal section showed the following: above and below the bulbous portion the tissue presented much the normal appearance, except its reaction to stain, the cells seeming to be swollen or undergoing some infiltrating process, the nerve-sheath being thickened. In the bulbous portion partial longitudinal sections of nerve-filaments could be demonstrated, but the main part of the bulbous portion was composed of fibrous connective tissue. Whether this was inflammatory product or whether it was an attempt at the re-establishment of the nerve by regeneration, I cannot say. I think that it was possibly more an hyperplasia of the neuroglia than anything else, and that there were distinct nerve-fibres present; these fibres were widely disseminated and were not arranged in bundles, the nerve-tissue reacting to stain very much the same as that beyond the bulbous portion. I cannot say that there was any particular bulging on either end of the injured nerve. Transverse sections of the nerve fully confirm the appearance of the longitudinal. As to the exact character of the nerve element present, it is very difficult to say. My own belief is that, first of all, there has been over-development of the fibrous nerve-sheath within which is slowly developing the nerve-fibres, and that should this process continue, function would largely be re-established."

On May 26 I made an electrical examination. I found that there was no change in the electrical reactions since the previous examination. The muscles of the left forearm all showed the reaction of degeneration and gave no response to the faradic current. Electrical treatment was now instituted and was continued with fair regularity, and in September massage was begun. In the latter part of October, 1894, the patient began to have slight power to extend the wrist. The muscular power gradually increased, and on December 26 the following conditions were present: the patient is able to extend the wrist fully and strongly; there is also full power of extension of all of the fingers. He uses his hand for all ordinary purposes, driving frequently a pair of hard-pulling horses. The sensation is fully restored over the area in which it was impaired. With the dynamometer the grip of the right hand is 140; left, 65. The extensor muscles of the left forearm still fail to respond to the faradic current, either with slow or rapid interruption. There is an improvement, however, in the reaction to the galvanic current. There is still marked quantitative change, but the reaction of degeneration is no longer present. The anodal closing contraction is about equal to the cathodal closing contraction.

On April 9, 1895, fourteen months after the division of the nerve and eleven months after nerve suture, an examination of the patient shows decided gain in muscular power since the last note. The patient can extend the hand and fingers strongly, and says that he feels no

sense of weakness in using it. With the dynamometer the right hand registers 130; the left, 84. None of the muscles supplied by the musculo-spiral nerve respond to the faradic current. The reaction of degeneration is no longer present; in fact, there is but slight reaction to the galvanic current with either anodal or cathodal closure. A very strong current causes slight tetanic contraction of the extensor carpi radialis. Sensation in the hand is normal, as is the temperature of the part.

The case is interesting for several reasons. In the first place, it shows the advantage of nerve suture after an interval of three months, during which time the patient had taken but little care of himself, and it also shows the importance of persistent and thorough electrical treatment to the parts supplied by the nerve, even when but little encouragement is given in the results of the treatment after several months, for the first evidences of gain did not make their appearance until October, or five months after the operation. The electrical reactions have also been interesting and typical. In the first place, the reaction of degeneration and complete absence of response to the faradic current showed that there was entire interruption in the course of the nerve, and made the diagnosis clear as to complete division of the nerve; and later, the interesting fact of restoration of voluntary power in the muscles before return of electrical reactions is important, as bearing out the experience of other observers. Another point of special interest is the effort which the nerve had made in regeneration, as is shown by the report of Dr. Kyle. He stated that in the bulb of connective tissue which occupied the space between the severed ends of the nerve, nerve-filaments could be demonstrated, which, although not numerous and not arranged in bundles, show distinct nerve-fibres. It seems probable that in time these nerve-fibres would have become more numerous and more fully developed, and possibly have completed connection between the distal and proximal ends of the nerve. This, however, is by no means a certainty, as it is well known that in the proximal end of a divided nerve regeneration may at first take place and be followed later by degeneration of all of the nerve elements, so that it is not assured that, had no operative interference been undertaken, the functions of the nerve would have been restored by nature. The case seems, therefore, to show the advantages and necessity for nerve suture without waiting for reunion to occur as a result of the normal healing process.

OPIUM-POISONING TREATED WITH POTASSIUM PERMANGANATE.

By Norton Downs, M.D., Germantown, Pa.

I DESIRE to add some additional testimony to the mass of evidence that has accumulated of late as to the value of permanganate of potassium in opium-poisoning, especially after the drug or its alkaloids have been absorbed and are exerting their deadly influence upon the cerebral centres.

The case I am about to report presents in a striking manner the point in question.

I was recently summoned to see a man of thirty years of age, of marked mental attainments and perfect physical health, but who had been under great mental strain of late. I learned from him that three-quarters of an hour previous he had swallowed the contents of a vial of lead-water and laudanum.

A hasty examination showed that he was laboring under intense excitement; his pulse was 140 and very small, respiration slow, and the pupils somewhat contracted. He answered questions intelligently and with perfect frankness; he begged me not to give an emetic, and, in fact, declared that he would refuse to swallow one. But, fortunately, I had in my hypodermic case some apomorphine, and of course he made no objection to my giving him 1/6 grain. The action of the drug was most satisfactory, and I could not but be astonished at the promptness with which the vomiting began, for in less than a minute from the injection of the drug he was beginning to relieve his stomach of what remained of the poison. This, as I had feared, proved to be but a small portion of the amount swallowed. He was much incensed at the trick that had been resorted to, and he thereupon flatly refused to assist me by swallowing water to wash out the stomach more completely.

Soon after the vomiting had ceased the effect of the opium became prominent, and he gradually sank into a state of almost complete coma, despite all the efforts to keep him awake, so that it was with great difficulty that he could be aroused to answer in monosyllables a question asked.

His pulse, which had previously been so rapid, doubtless due to the excitement incident to the fact of his having attempted to take his life, now became very slow,—from 36 to 44 to the minute. The respirations were shallow and about 8 to 10 per minute. The pupils, which were contracted on my arrival, were now pin-point in character, and the case was certainly assuming a grave aspect.

The value of a hypodermic injection of permanganate of potassium came to my mind, and hurriedly getting a solution, I gave ½ grain in the thigh, and repeated the dose a moment later.

The pain occasioned by the introduction of the drug was felt by the patient, causing him to draw away the leg, but he showed no further evidence of consciousness.

Now comes the interesting point to which I wish to call particular attention.

In less than fifteen minutes from the time the last hypodermic injection was given, from being in a condition of almost absolute coma, with pin-point pupils, a slow pulse, and infrequent respiration, he had entirely returned to consciousness. The pupils were dilated, the pulse about 100, and in a perfectly natural manner he was talking of the sensations through which he had passed, and his regret at my having given him relief.

The length of time elapsing from the taking of the laudanum—which I estimated at about 3 drachms—to the time he was given the permanganate of potassium, of which he received a grain, was about two and a half hours.

I remained with the patient for some time, and seeing that there was no returning drowsiness, departed, leaving instructions for future treatment.

On seeing him the following day, he reported having passed a comfortable night, without sleeping, but that his mind was constantly filled with pleasing dreams and pictures.

The result of this case was prompt and satisfactory. Even though he probably would have survived the ingestion of the 3 drachms of laudanum, his condition at the time the permanganate of potassium was given was so critical that we must, I think, give due credit to the drug which in such a striking manner demonstrated its power.

In the medical journals one has frequently been confronted of late with reports as to the value of permanganate of potassium in cases of opium-poisoning. Within the past week I have seen reported cases where its proper use secured almost miraculous results. Unfortunately, I have not the precise data with me, but one case was reported in a recent issue of the *New York Medical Journal* and the other in the THERAPEUTIC GAZETTE. In both reports it was stated that the patients were completely narcotized, but that they returned to consciousness, and the symptoms abated shortly after the injection of the permanganate of potassium.

It is true that the case I have reported probably would have survived the ingestion of only 3 drachms of laudanum, but at the time I gave the hypodermic I was uncertain as to the quantity that had been taken, and the symptoms were of a grave character and warranted all the apprehension that was shown.

The permanganate almost immediately relieved a threatening coma, bringing the patient back to complete consciousness. I am so well satisfied in my own mind as to its great value that, should I be placed in a like situation again, the free use of permanganate would be the first means of treatment suggesting itself to me.

THE CHEMISTRY OF SOME RECENT SYNTHETIC ORGANIC COMPOUNDS.

BY CHARLES S. BOYER, PHILADELPHIA, PA.

WITHIN the last ten years the medical profession has witnessed the introduction of more new drugs and remedies into her materia medica than in any period of equal length in her history. It is also to be noted that the greater portion of these new preparations have been the immediate product of chemical research. The natural query is, therefore, "Why is it that chemistry has been able to present to medical science such an array of new compounds?" The answer to this question is to be found in the fact that chemistry has, in the last twenty years, been placed on a solid foundation, and the chemist is now in a position, not only to reason out the reactions for the formation of new compounds, but is also able to present these reactions in such a manner that they may be carried out on a practical scale. By following the tenets of theoretical chemistry, we can form new compounds from various simple substances in such a manner as that the resulting product will retain all of the therapeutic properties of the individual substances. We can also figure out the probable structural formula for such a compound, and indicate its stability and its important chemical reactions.

The early history of chemistry is very clearly connected with that of medicine; in fact, it is to the latter profession that chemistry owes her origin. The first chairs of chemistry in our colleges and universities were founded in connection with the medical schools, and, until 1830, chemistry was prosecuted almost exclusively by physicians or those connected directly or indirectly with medical science. During the period 1840 to 1870 chemistry pursued her course almost independent of medicine. Her

great advancement during this time was due not to physicians, who devoted, as of old, a portion of their time in desultory groping after new compounds which would have a therapeutic value, but to scientists (many of them physicians) whose chief aim was to investigate old hypotheses and to discover new ones. As a result of this line of investigation, chemistry attained a permanent place in the category of the sciences, and the pathway was made easy for its successive triumphant march.

The establishment of the coal-tar-color industry marks an epoch not only in the industrial sciences, but also in the medical world. The immediate result of this new industry was the stimulation of chemical investigation. Two sets or classes of chemists, or rather chemical investigators, arose,—those who were after purely scientific truths and those whose chief aim was the obtaining of products or compounds having some direct practical value. During the course of these investigations the seeker after new therapeutic compounds frequently discovered products possessing a value as dyes; the dye-seeking chemist would prepare medical chemicals, while the investigator in the domain of pure chemistry would frequently discover compounds having great value in technical fields. Numerous researches having only a theoretical value have emanated from the laboratories established in connection with the large German chemical works; while, on the other hand, the laboratories of the great German universities have been the birthplace of more than one compound which has been a blessing to man. It is now evident that these two lines of investigation are so closely connected and interwoven that they virtually merge into one, and we cannot distinguish between them.

As to the benefit of this awakening in chemical research on medical science, the results speak more emphatically than could any words. To-day we have synthetic medical compounds galore, and who will venture an opinion as to the limit of such discoveries? As Professor Sadtler has aptly said, "If the question be asked, What limits can be set to the possibilities in the direction of synthetic manufacture? I would remind the inquirer that when W. H. Perkin discovered mauve, the first of the aniline dyes, in 1856, no one could have predicted the enormous development of the coal-tar-color industry. So now it is impossible for us to foresee how extensive or how rapid will be the development of the manufacture of synthetic remedies."

In view of these facts, it has seemed to me eminently proper that medical men should be conversant, first, with the chemical character of the well-known synthetic compounds; second, with the synthetic compounds whose therapeutic value have not yet been fully established; and, lastly, with the possibilities of synthetic chemistry. A medical man can almost foresee the probable value of new compounds, if he will but view them from a *chemical-medical* stand-point. By this I mean the taking into consideration not only of the structural composition of the compound, but also the medical properties of known compounds having an analogous composition, or containing certain *radicals*, or elements, which, when in certain positions, exert definite properties.

The large number of artificial remedies can be, for convenience, grouped according to their chemical composition into those whose theoretical structure is that of an *open chain*, as is illustrated in methane and its derivatives, and into those having a *closed chain*, or *ring structure*, as, for example, benzole and its derivatives.

I have prepared two tables containing the more important compounds of each group. These tables include a number of remedies whose origin is not very recent, in order that the connection between the types (methane and benzole) and the new compounds may be easily discerned. We will, however, only discuss the remedies which have been proposed within the last two or three years, together with two or three of the *very important* synthetic compounds proposed in the early eighties.

TABLE I.

Common Name.	Chemical Name.	Formula.
Marsh gas	Methane	CH_4.
Chlormethane	Monochlormethane	CH_3Cl.
Methylene chloride	Dichlormethane	CH_2Cl_2.
Chloroform	Trichlormethane	$CHCl_3$.
Bromoform	Tribromethane	$CHBr_3$.
Iodoform	Triiodomethane	CHI_3.
	Monochlorethane	C_2H_5Cl.
Ethyl bromide	Monobromethane	C_2H_5Br.
Amylene hydrate	Dimethylethylcarbinol	$(CH_3)_2.C(OH).C_2H_5$.
Sulphuric ether	Ethyl ether	$(C_2H_5)_2.O$
Methylal	Methylene-dimethylether	$CH_2.(O.CH_3)_2$.

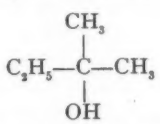
TABLE I.—*Continued.*

Common Name.	Chemical Name.	Formula.
Acetal	Ethylidene-diethylether	$CH_3.CH(O.C_2H_5)_2$.
	Amyl nitrate	$C_5H_{11}.ONO$.
	Methylamine	$CH_3.NH_2$.
	Trimethylamine	$(CH_3)_3.N$.
Piperazine	Diethylene diamine	$(C_2H_4)_2.(NH_2)_2$.
	Acetaldehyde	$CH_3.CHO$.
	Paraldehyde	$(CH_3.CHO)_3$.
Chloral hydrate	Hydrated trichloraldehyde	$CCl_3.CHO. + H_2O$.
Croton chloral	Hydrated trichlorbutyraldehyde	$C_3H_4Cl_3.CHO. + H_2O$.
Acetone	Dimethylketone	$CH_3.CO.CH_3$.
Acetic ether	Ethyl acetate	$CH_3.CO.OC_2H_5$.
	Acetic acid	$CH_3.CO.OH$.
	Formamide	$CHO.NH_2$.
Chloralamide	Chloral formamide	$CCl_3.CH(OH).NH.CHO$.
	Acetamide	$CH_3.CO.NH_2$.
Chloralimide		$CCl_3.CH.NH$.
Urethane	Ethyl-ester	$NH_2.CO_2.C_2H_5$.
Phenyl urethane	Phenylethyl	$NH.(C_6H_5).CO_2.C_2H_5$.
Urea	Carbamide	$CO.(NH_2)_2$.
Dulcine, or Sucrol	Paraphenetol carbamide	$CO.(NH_2).(NH.C_6H_4)(O.C_2H_5)$.
Sulphonal	Diethylsulphon-dimethylmethane	$(C_2H_5.SO_2)_2.C.(CH_3)$.
Trional	Diethylsulphon-ethylmethylmethane	$(C_2H_5.SO_2)_2.C.(C_2H_5).(CH_3)$.
Tetronal	Diethylsulphon-diethylmethane	$(C_2H_5.SO_2)_2.C.(C_2H_5)$.

On carefully studying the above table, it will be observed that all of these compounds are obtained by substituting the radicals or groups *methyl*, CH_3, *ethyl*, C_2H_5, *phenyl*, C_6H_5, *amine*, NH_2, *nitro*, NO_2, *hydroxyl*, OH, etc., in the formula for methane. This class might be well termed the *substituted methane series*. It is frequently called the *fatty* series, in distinction from the *aromatic* or *benzene* series.

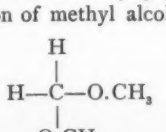
DESCRIPTION OF THE CHEMICAL AND THERAPEUTIC CHARACTERS OF SOME OF THE RECENT COMPOUNDS OF GROUP I.

Amylene Hydrate, $C_5H_{12}O$.—It is prepared from amylene by the action of sulphuric acid

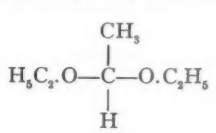


and water. It is a clear fluid, having a camphor-like odor. It is soluble in eight parts of water; also soluble in alcohol. Its specific gravity at 0° C. is .827 and its boiling-point 102.5° C. When cooled to —12.5° C. it solidifies. Its use is that of an hypnotic and anodyne. It has not, however, been altogether satisfactory, as it seems to have no advantages over bromides, which are much cheaper. As an hypnotic, it is superior to paraldehyde, since it produces no disagreeable after-effects. It is not equal therapeutically to chloral.

Methylal, or *Formal*, $C_3H_8O_2$, is obtained by the oxidation of methyl alcohol with manganese dioxide and sulphuric acid, and distilling the product of the reaction. It is a colorless, ethereal liquid, of specific gravity .855, and boils at 42° C. It is miscible with alcohol and ether, and dissolves in three parts of water. Its odor resembles chloroform and acetic ether. It is used as an hypnotic, but, since the patient becomes rapidly used to it, it must be used in increasing doses. It is also employed as a local anæsthetic, nerve sedative, and anodyne.

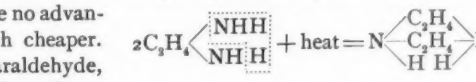


Acetal, $C_6H_{14}O_2$, occurs in the distillation of crude spirit, or may be produced by heating



alcohol and acetaldehyde to 100° C. It is a limpid liquid, difficultly soluble in water, and having an odor like that of alcohol. It boils at 104° C., and has a specific gravity of .8314 at 20° C. It is used as a narcotic.

Piperazine, $C_4H_{10}N_2$, is diethylene diamine. It is obtained by the decomposition of the ethylene diamine by heat, thus:

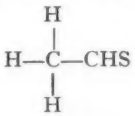


or from ethylene dichloride by heating with alcoholic ammonia, thus: $2C_2H_4Cl_2 + 4NH_3 = (C_2H_4)_2N_2H_2.2HCl + 2NH_4Cl$. The diethylene diamine hydrochloride is then distilled with KOH to set the base free.

Piperazine occurs as colorless, nearly tasteless, crystals, easily soluble in water and alcohol, and having a melting-point of 104° to 107° C.

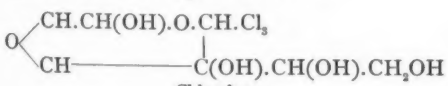
and a boiling-point of 135° to 138° C. It is a solvent for uric acid, forming neutral urates, $C_4H_{10}N_2.C_5H_4N_4O_3$, possessing twelve times the solvent power of lithium carbonate. Piperazine hydrochloride, $(C_2H_4)_2N_2H_2.2HCl + H_2O$, crystallizes in needles easily soluble in water and alcohol. The salicylate has also been employed. Piperazine phosphate forms four-sided tabular crystals.

Sulphaldehyde, C_2H_4S, or acetaldehyde, in which the oxygen is replaced by sulphur, is obtained by the action of sulphuretted hydrogen on acetaldehyde in aqueous solution. It is an oily liquid, having a disagreeable odor; it

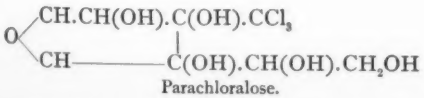


soldifies at —8° C. The commercial product consists of a mixture of sulphaldehyde and acetaldehyde, with a probable composition, $CH_3.CHS + (CH_3.CHO)_2.CH_3CHS$. It is analogous to paraldehyde in its therapeutic properties, but is much more powerful.

Chloralose, $C_8H_{11}Cl_3O_6$.—Hauriot and Richet combine chloral and glucose and obtain an hypnotic. Equal parts of anhydrous chloral and dry glucose are mixed and heated to 100° C. for one hour. After the mass has cooled it is treated with a little water and then with ether. By removing the ether-soluble portion, adding water, and distilling five or six times with water until the chloral unacted upon has been driven off, a residue is obtained, which, by successive crystallizations, separates into two bodies. The first of these is slightly soluble in cold water (6 to 1000), but easily in hot water and in alcohol; the second is difficultly soluble, even in hot water. The first compound has been named by its discoverers *chloralose*, and the second *parachloralose*. Chloralose consists of small needles, having a bitter taste and melting at 187° C. These being very recent products, comparatively little is known of their therapeutic value. The structural formulæ for these compounds are:



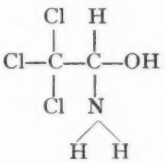
Chloralose.



Parachloralose.

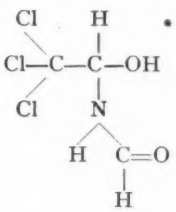
Parachloralose melts at 227° C.; it sublimes, if carefully heated, without decomposition; it is unacted upon by acids, and only slowly attacked by boiling solutions of alkalies.

Chloral Ammonium, $C_2Cl_3H_4NO$, is prepared by passing ammonia gas through a solution of anhydrous chloral in chloroform. It is obtained as small needles, melting at 62° to 64° C., and almost insoluble in cold water.



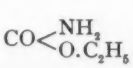
Hot water decomposes it into ammonia and ammonium formate. On standing six to eight months, it suffers decomposition into ammonia, ammonium chloride, and chloralformamide. When heated to 100° C. the products of the decomposition are very complexed.

Chloralamide, $C_3H_4Cl_3NO$, is obtained by the combination of anhydrous chloral and formamide. It consists of colorless, odorless crystals, having a mild, slightly bitter taste, and melting at 114° to 115° C. It is soluble in ten parts of cold water, and when dissolved in water

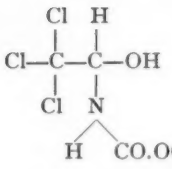


heated above 60° C. it decomposes into chloral and formamide. On this account care should be taken to use cold water for its solution. It was proposed in 1889 by Von Mering as an hypnotic. It induces natural and refreshing sleep, and, as a rule, is not followed by headaches on awakening. It is thought by some to be a deeper sleep than that produced by chloral. It was at one time thought that its action was caused by the decomposition in the system, but there does not occur with it the marked depression so characteristic of chloral.

Chloral Urethane, or *Uralin*, $C_5H_8NCl_3O_3$, is another of the chloral substitutes. It is obtained by mixing a solution of chloral and

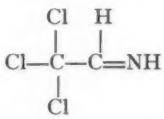


urethane with strong hydrochloric acid. It is obtained as a white, scaly mass, melting at



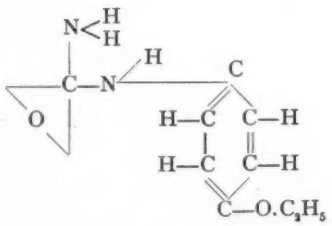
103° C. It is easily soluble in alcohol and ether, but almost insoluble in water. It is split up into its components when treated with hot water.

Chloralimide, $C_3H_2NCl_3$, is obtained by boiling hydrate with ammonium acetate, or by heating solid chloral ammonium to 100° C. The product is washed with ninety-five per cent. alcohol, and crystallized from a mixture of one part of benzene and one part of absolute alcohol. It occurs as colorless, inodorous, tasteless, rhombic crystals or needles, which melt



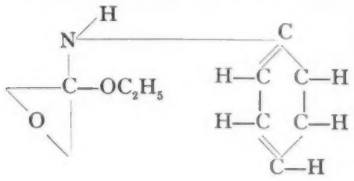
at 150° to 155° C. It is easily soluble in alcohol (two parts in one hundred parts of ninety-five per cent. alcohol), ether, chloroform, and the oils; insoluble in water. It decomposes by heating with water to 180° C. into CO_2, hydrochloric acid, chloroform, chloral, ammonium chloride, formamide, and formic acid. It is analogous therapeutically to chloral.

Dulcine, or *Sucrol*, $C_9H_{12}N_2O_2$.—This compound is really on the border line between the open-chain and closed-chain groups. It is obtained from paraphenetidine by the action of carbon oxychloride. It is best adapted for its



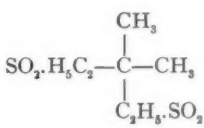
use in a fine crystalline form. It melts at 160° C.; it is soluble in alcohol, ether, hydrochloric acid, and acetic acid. One hundred cubic centimetres of water at 20° C. dissolve .16 gramme; at 80° C., .65 gramme. It has two hundred times the sweetening power of cane-sugar. Since there is some difficulty in moistening the powdered sucrol, it is used for sweetening tea, coffee, etc., in the form of minute crystals. The requisite amount of sucrol is put in the cup and the hot liquid poured over it. It will not disguise the bitter taste of drugs. Sucrol has been proclaimed therapeutically harmless.

Euphorin, $C_9H_{11}NO_2$, is an antipyretic which has found considerable use in obstetrical and

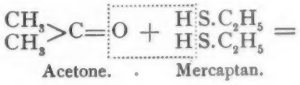


gynæcological cases. It occurs as a white, crystalline powder, with a slight aromatic odor, and with an acrid, clove-like after-taste. It is only slightly soluble in water. It is stated to be equal to twice its weight of antipyrin. It is claimed to have pronounced antiseptic properties. Dr. Bossi states "that it acts both more efficaciously and more rapidly than any other substance hitherto in use, not excepting iodoform."

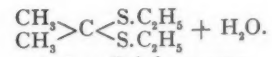
Sulphonal, $C_7H_{16}(SO_2)_2$, is one of the older synthetic remedies, having been discovered by Baumann in 1885, although only used in medicine about 1889. It is produced by the action of dry hydrochloric acid on a mixture of



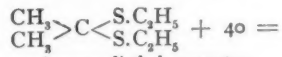
acetone and mercaptan, producing acetone diethyl mercaptan, which, by oxidation with permanganate of potassium, yields sulphonal.



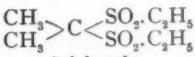
Acetone. Mercaptan.



Acetone diethyl mercaptan.



Acetone diethyl mercaptan.

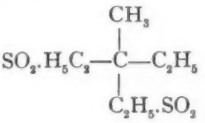


Sulphonal.

It occurs in heavy prismatic crystals, or in a crystalline powder, which melts at 125.5° C. and boils at 300° C. It dissolves in fifteen parts of boiling water, five hundred parts of water at 15° C., in one hundred and thirty-five

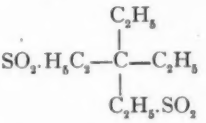
parts of ether, in sixty-five parts of absolute alcohol at 15° C., in two parts of boiling absolute alcohol, and in one hundred and ten parts of fifty-per-cent. alcohol. The melting-point and solubilities serve as a means of determining its purity. It is an hypnotic of great value.

Trional, $C_8H_{18}(SO_2)_2$, an hypnotic having a composition analogous to sulphonal, occurs in



shining tables, soluble in three hundred and twenty parts of cold water and melting at 76° C. It is easily soluble in alcohol and ether.

Tetronal, $C_9H_{20}(SO_2)_2$ (not to be confounded with the hydrocarbon *tetrol*), also belongs to the sulphonal class. It, like trional, is a patented product. It melts at 85° C. and is easily



soluble in alcohol; one part is soluble in four hundred and fifty parts of cold water.

It has been found that only those disulphones (to which class sulphonal, trional, and tetronal belong) which contain the ethyl group (C_2H_5) are physiologically active, and that the hypnotic activity increases with the number of such groups. In sulphonal there are only two ethyl groups, in trional there are three, while in tetronal there are four, and the hypnotic effect was found to increase in this proportion, tetronal requiring only one-half the quantity to produce the same effect as sulphonal.

TABLE II.

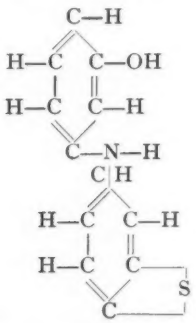
Common Name.	Chemical Name.	Formula.
Benzene	Benzole	C_6H_6.
	Diphenylamine	$C_6H_5.NH.C_6H_5$.
Sulphaminol	Thioxydiphenylamine	$C_6H_3(OH).NH.C_6H_4S$.
	Triphenylamine	$(C_6H_5)_3.N$.
Antifebrin, or Acetanilide	Phenylacetamide	$C_6H_5.NH.(C_2H_3O)$.
Exalgin	Methylphenylacetamide	$C_6H_5.N(CH_3).C_2H_3O$.
Methacetin	Paraoxymethylphenylacetamide	$C_6H_4.(O.CH_3).NH.C_2H_3O$.
Phenacetin	Acet-paraphenetidine, or Para-oxy-ethyl-phenyl-acetamide	$C_6H_4(O.C_2H_5).NH.C_2H_3O$.
Methyl phenacetin	Para-oxy-ethyl-phenyl-methyl-acetamide	$C_6H_4.(O.C_2H_5).N(CH_3).C_2H_3O$.
Sedatin	Paravalerylphenetidine, or Paravaleryl	$C_6H_4.(OC_2H_5).NH.C_5H_9O$.
Phenocoll	Phenylglycocoll (Amido-para-acet-phenetidine)	$C_6H_4(OC_2H_5)NH(C_2H_2ONH_2)$.
	Phenylhydrazine	$C_6H_5.N_2H_3$.
Pyrodine	Acetylphenylhydrazine	$C_6H_5.N_2H_2.C_2H_3O$.
Agathin	Salicylaldehyde α-methylphenylhydrazone	$C_6H_4(OH).CH.N:N.CH_3.C_6H_5$.
Carbolic acid	Phenol	$C_6H_5.OH$.
Aseptol	Orthophenylsulphonic acid	$C_6H_4.OH.HSO_3$.
Diaptherin	Oxychinphenylsulphonic acid	$(OH).C_9H_6.NH.O.SO_2.C_6H_4.ONH.C_9H_6(OH)$.
Sozal	Aluminum salt of paraphenylsulphonic acid	$(C_6H_4.OH.HSO_3)_3Al$.
Sozoiodol	Diiodoparaphenylsulphonic acid	$C_6H_2I_2.(OH)\ HSO_3$.
Cresylic acids	Cresols	$C_6H_4<^{OH.}_{CH_3}$.
Europhen	Isobutyl-ortho-cresol-iodide	$C_6H_3I.CH_3.O.C_4H_9$.
Resorcin, Hydroquinone	Metadioxybenzole, Paradioxybenzole	$C_6H_4(OH)_2$.
Thioresorcin		$C_6H_4(SH)_2$.
Pyrogallic acid	Orthotrioxybenzole	$C_6H_3(OH)_3$.
Hypnone	Acetophenone, or Phenylmethylketone	$C_6H_5.CO.CH_3$.
Gallacetophenone	Trioxyacetophenone	$C_6H_2(OH)_3.CO.CH_3$.
Benzoic acid		$C_6H_5.COOH$.
Benzo-naphtol	β-naphtol-benzoate	$C_6H_5.CO.OC_{10}H_7$.
Benzanilid	Phenyl benzamide	$C_6H_5.CO.NH.C_6H_5$.
Saccharin	Benzoyl sulphinide	$C_6H_4.SO_2.CO.NH$.
Salicylic acid	Orthooxybenzoic acid	$C_6H_4.(OH).COOH$.
	Diiodosalicylic acid	$C_6H_2I_2(OH)COOH$.
	Sulphosalicylic acid	$C_6H_3.(HSO_3).(OH).COOH$.
	Dithiosalicylic acid	$(C_6H_3.(OH).COOH)_2S_2$.
	Tetrachlordithiodisalicylic acid	$(C_6H(OH)ClCOOH)_2S_4$.
Salol	Phenyl salicylate	$C_6H_4.(OH).CO.O.C_6H_5$.
Salophen	Acetylparaamidophenyl salicylate	$C_6H_4(OH)CO.OC_6H_4NH.CO.CH_3$.
Naphtalol, Naphtosalol, Salinaphtol	Betol	β-naphtol salicylate $C_6H_4.(OH).CO.OC_{10}H_7$.
Salipyrin	Antipyrine salicylate	$C_{11}H_{12}N_2O.C_7H_6O_2$.
Salicylamide	Salicylamide	$C_6H_4.(OH).CO.NH_2$.

TABLE II.—*Continued.*

Common Name.	Chemical Name.	Formula.
α-naphtol	α-Naphtol }	{ $C_{10}H_7.(OH)$.
β-naphtol	β-Naphtol }	{
Asaprol	β-naphtol α-mono-sulphate of calcium	$(C_{10}H_6.(OH).SO_3)_2Ca + 3H_2O$.
Alumnol	Aluminum β-naphtol sulphate	$(C_{10}H_6.(OH)SO_3)Al$.
	Pyrrol	$C_4H_4.NH$.
Iodol	Tetraiodopyrrol	$C_4I_4.NH$.
	Diphenyl methyl-pyrazol	$C_3(C_6H_5)_2.(CH_3)_2NH$.
Antipyrine	Phenyl-dimethyl-iso-pyrazolone	$C_6H_5.(CH_3)_2.C_3.HN_2O$.
	Quinolin	C_9H_7N.
Analgen	Orthooxyethyl-anomonobenzoylamidoquinolin	$C_9H_5.NO.(C_2H_5).NH.CO.C_6H_5$.
Methyl kairoline	Methyltetrahydroquinolin sulphate	$C_9H_{10}.N(CH_3).H_2SO_4$.
Methyl kairine	Oxytetrahydromethylquinolin hydrochlorate	$C_9H_{10}NO.(CH_3).HCl + H_2O$.
Thalline	Tetrahydroparaquinanisol	$C_9H_{10}.N.(O.C\ H_3)$.
Thermifugin	Methyltrihydrooxyquinolin carbonate of sodium	$C_9H_8(CH_3).N.CO.ONa$.

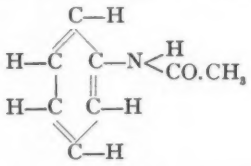
DESCRIPTION OF THE CHEMICAL AND THERAPEUTIC CHARACTERS OF SOME OF THE RECENT COMPOUNDS OF GROUP II.

Sulphaminol, $C_6H_3(OH).NH.C_6H_4S$, is a comparatively recent antiseptic, and was proposed as a substitute for iodoform. It is obtained by the reaction between methoxydi-



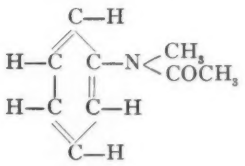
phenylamine and sulphur, as a light yellow powder, which is insoluble in water, and possesses no *odor* or taste. It does not appear to have met with the success which was predicted for it.

Acetanilide, $C_6H_5.NH.(C_2H_3O)$, was recognized by Cahn and Heppe in 1885 as an anti-



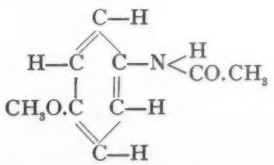
pyretic. It is prepared by boiling equal parts of aniline and glacial acetic acid for twelve hours, allowing the liquid to cool; whereupon it solidifies. The cooled mass is at once distilled until excess of acetic acid is expelled, and the liquid which passes over solidifies at 35° C.; when this point is reached, the receiver is changed and the acetanilide collected. When it is purified by recrystallization, the rhombic colorless plates melt at 112° C. It is soluble in eighteen parts of hot or one hundred and ninety parts of cold water; easily soluble in ether, alcohol, and chloroform. Its therapeutic properties are too well known to need description.

Exalgin, $C_6H_5.N(CH_3).C_2H_3O$, was introduced in 1889 by Dujardin-Beaumetz and Bardet as a substitute for acetanilide. It is produced by acting on mono-methyl aniline with acetyl chloride. It crystallizes from



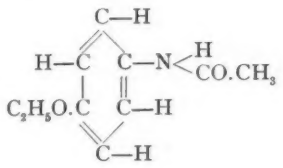
water in spear-like crystals, which are difficultly soluble in cold water, more readily in hot, easily in dilute and concentrated acetic acid and in alcohol. It melts at 100° C. and boils at 245° C.

Methacetin, $C_6H_4.(OCH_3).NH.C_2H_3O$, was a short time back pronounced as the successor of phenacetin, which compound it very closely resembles. Methacetin contains a methyl group and phenacetin an ethyl. It occurs in a reddish-white, odorless, crystalline powder, having a bitter taste. It is soluble in five hundred and



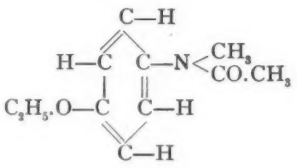
twenty-six parts of cold water or twelve parts of boiling water, and lacks any poisonous properties. Its melting-point is 127° C.

Phenacetin, $C_6H_4(O.C_2H_5).NH.C_2H_3O$. — This compound came into use as a therapeutic media in 1887, when Von Hinsberg and Kast announced the results of their extended study. It forms a white, crystalline, odorless, and al-



most tasteless powder. If pure, it should require about seventy cubic centimetres of boiling water for its complete solution, which should have a neutral reaction. One part dissolves in fifteen hundred parts of cold water and freely in alcohol. It melts at 135° C., and should burn without leaving a residue. A fall of two degrees below the melting-point given above is cause for suspicion of adulteration, according to Platt.

Methyl Phenacetin, $C_6H_4(O.C_2H_5).N(CH_3).C_2H_3O$, is a patented preparation put on the market. When purified by recrystallization from alcohol or ether, it is a colorless crys-



talline body, which melts at 40° C., and is moderately soluble in water and easily in alcohol and ether. Very little is yet known of its therapeutic action.

The following tests serve for the identification of phenacetin:

1. Boil with hydrochloric acid; dilute the solution with water; cool, and filter from the reprecipitated crystals; two or three drops of potassium bichromate added to the filtrate will produce a ruby-red color.

2. Boil with water; cool and filter; add bromine water until a yellow color is produced; the solution should remain clear if the sample be unadulterated.

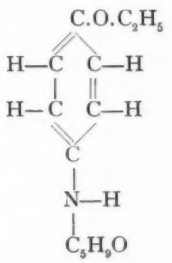
3. Boil with hydrochloric acid and ferric chloride; a red color is produced.

4. Boil with ten- to twenty-per-cent. nitric acid, bright yellow crystals of the nitro-derivative separate out and the liquid becomes orange.

5. Heat with alcohol and sulphuric acid, ethyl acetate will be evolved; heat the solution with potash and chloroform to obtain the carbylamine reaction.

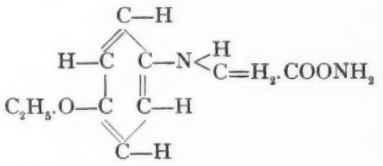
6. Boil with potash, alcohol will be evolved (distinction from acetanilide).—Platt (*Journ. of Anal. and App. Chemistry*, 1893, pp. 77–83).

Sedatin, $C_6H_4(O.C_2H_5).NHC_5H_9O$, is a very recent acquisition. It is prepared by the action of valeric acid on phenetidine or by the action of phenetidine hydrochlorate upon sodium valerianate. It crystallizes in fine needles,



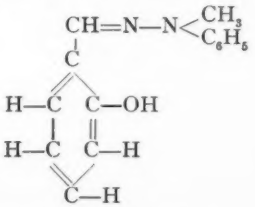
and is only slightly soluble in benzole, ether, chloroform, and cold methyl or ethyl alcohol; it is quite soluble in the two latter, when hot.

Phenocoll, $C_6H_4(OC_2H_5)NH(C_2H_2ONH_2)$, is one of the few synthetic antipyretics which is readily soluble in water. This compound is



most largely, if, indeed, not always, used as a salt, the hydrochlorate being preferred, although the acetate, carbonate, and salicylate have also been tried. The base, phenocoll, melts at 126° C. The hydrochlorate is soluble in sixteen parts of water. It has been tried in pneumonia, rheumatism, etc., with satisfactory results.

Agathin, $C_6H_4(OH)CH.N_2CH_3C_6H_5$, is prepared by the condensation of salicyl aldehyde with α-methylphenylhydrazin. It occurs in



greenish plates, having neither odor nor taste. It is insoluble in water, but soluble in alcohol, ether, and benzene.

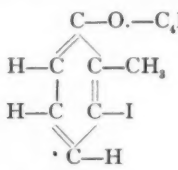
$$C_6H_4OH.CHO + \frac{C_6H_5}{CH_3}>N:NHH = C_6H_4OH.CH.N:NCH_3.C_6H_5$$

Salicyl aldehyde. *a*-methylphenylhydrazin. Salicyl aldehyde. *a*-methylphenylhydrazone.

Dr. Rosenbaum, after an extended use in the Frankfort hospitals, pronounces it a valuable antineuralgicum.

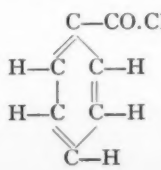
Diaptherin, $(OH).C_9H_6.NH.O.SO_2.C_6H_4.ONH.C_9H_6(OH)$, is made by combining one molecule of aseptol (orthophenolsulphonic acid) with two molecules of oxyquinolin. When recrystallized from water it forms amber-yellow, hexagonal crystals, possessing a carbolic acid odor. When powdered it is soluble in its own weight of water and easily soluble in most ordinary solvents. It melts at 85° C. It is a powerful non-irritant and relatively non-toxic, agreeable antiseptic. It, however, possesses a very serious defect,—namely, that it blackens nickel and silver, and cannot, therefore, be used for disinfecting operating instruments. It is claimed to possess less toxic effects than carbolic acid or corrosive sublimate, and to be equally, if not more, powerful as an antiseptic, used in one-half- to one-per-cent. solutions.

Europhen, $C_6H_2.I.CH_3.O.C_4H_9$, is a recent antiseptic. It is a yellow amorphous powder, with an aromatic, saffron-like odor, insoluble



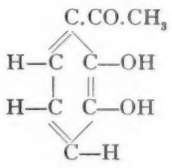
in water and easily decomposed by heat. On the latter account care must be taken in making up the solutions to keep the solvent (alcohol, etc.) cold, else the compound will decompose, setting iodine free. It is a powerful rival of iodoform, on account of its far less disagreeable odor and non-toxic property. It contains 27.6 per cent. of iodine.

Hypnone, or *Acetophenone*, $C_6H_5.CO.CH_3$, is a comparatively old preparation, and little more than its chemical properties need be touched upon. It crystallizes in large laminæ or plates,



which melt at 20.5° C. Liquid hypnone is a colorless, mobile, very refrangent liquid, possessing an odor of bitter almonds. Its specific gravity is 1.032. It is insoluble in water, sparingly soluble in glycerin, freely soluble in alcohol, ether, chloroform, benzole, and the fixed oils.

Gallacetophenone, $C_6H_2(OH)_3.CO.CH_3$, is a new and promising substitute for pyrogallic acid. It is prepared by heating one part of

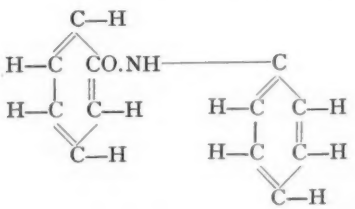


pyrogallic acid, one and a half parts of glacial acetic acid, and one and a half parts of zinc chloride to 156° C. It occurs in needle-like crystals, melting at 168° C. It is slightly soluble in cold water (.18 part in 100), easily soluble in hot water, alcohol, and ether.

Gallacetophenone, when sold as a dye-stuff under the name *alizarine yellow C*, occurs as a gray paste, containing twenty per cent. of dry coloring matter.

Benzonaphtol, $C_6H_5.CO.OC_{10}H_7$, is a recent substitute for betol. It is prepared by heating powdered β-naphtol with benzoyl chloride on a sand-bath slowly to 125° C. and then for a half-hour to 170° C. After cooling, the mass is recrystallized twice from alcohol. It occurs as small white, odorless, and tasteless crystals. It is practically insoluble in water at 15° C., more soluble in alcohol, and easily in chloroform. It melts at 110° C.

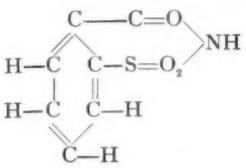
Benzanilide, $C_6H_5.CO.NH.C_6H_5$, is closely allied, both chemically and therapeutically, to acetanilide. It is obtained by boiling equal



parts of benzoic acid and aniline, and occurs as a white, crystalline, odorless powder, which has a slightly caustic taste. It is practically insoluble in water, soluble in fifty-eight parts of cold and seven parts of hot alcohol, and melts at 163° C.

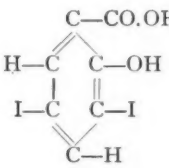
Saccharin, $C_6H_4(OH).COOH$, is one of the synthetic compounds to which Americans can

point with pride as having been worked out in an American laboratory. The reactions by



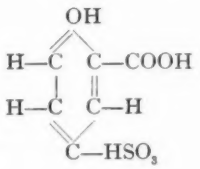
which it is made are too complexed for insertion here. It occurs as a white powder of a faintly aromatic odor, slightly volatile at 100° C., and melting at 200° C. It is soluble in two hundred and fifty parts of cold water, thirty parts of hot water, also in alcohol (1 to 30), and moderately soluble in ether. Its solubility in water is increased by the presence of alkalies or alkaline carbonates. It possesses an intensely sweet taste, being three hundred times sweeter than cane-sugar, one part possessing the power of perceptibly sweetening ten thousand parts of water. It passes unchanged through the system, and can be detected in the urine. It is a moderate antiseptic, but its use as a food preservative has been prohibited in France, Germany, and Belgium, because its use antagonizes the use of sugar, which is a valuable nutrient. It must not be confounded with Péligot's saccharin, which is an entirely different product. With bases it forms orthosulphaminbenzoic acid salts, which possess an equally sweet taste and are much more soluble. Pure saccharin leaves no residue on heating on platinum foil, and is not charred by warming with sulphuric acid.

Diiodosalicylic acid, $C_6H_2I_2(OH)COOH$, is an antirheumatic and antiseptic, like salicylic acid, obtained by the action of iodine and



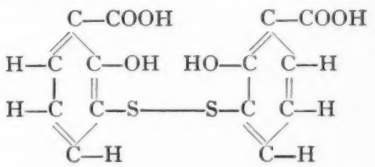
mercuric oxide on an alcoholic solution of salicylic acid. It is slightly soluble in cold, more readily in hot water and in alcohol. It crystallizes in needles, having a melting-point of 220° to 230° C. The sodium salt of this acid is the compound which has been used. It has not, however, been thoroughly studied.

Sulphosalicylic Acid, $C_6H_3.(SO_3H).(OH).COOH$, is obtained by the action of sulphur trioxide (SO_3) on salicylic acid, or by heating salicylic acid with sulphuric acid. It crystallizes in long, thin, very soluble needles,



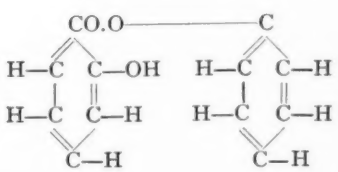
which melt at 120° C. The sodium salt, which is the compound used, occurs as a fine crystalline powder, of a sour, astringent taste, and easily soluble in water, but almost insoluble in alcohol and ether. Not yet on this market.

Dithiosalicylic Acid, $(C_6H_3(OH)COOH)_2S_2$, is a proposed substitute for salicylic acid. It is



prepared by heating sulphur chloride with salicylic acid, dissolving the melt in caustic soda, and reprecipitating the acid with hydrochloric acid. It occurs as a light yellow powder, easily soluble in alcohol, benzole, and glacial acetic acid. It is said to be more powerful than sodium salicylate, and does not produce the objectionable symptoms of the latter. It is a prompt, reliable, and agreeable antirheumatic, also an antiseptic. The sodium salt is principally used under the name "dithiosalicylate of sodium II."

Salol, $C_6H_4(OH).CO.OC_6H_5$, is too well known to need any introductory remarks, and will be discussed only from a chemical stand-



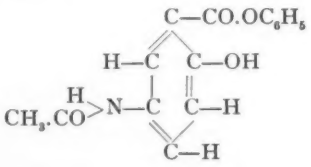
point. It is prepared commercially by heating sodium salicylate and sodium phenate with phosgene gas (or carbonyloxychloride), thus:

$$C_6H_4{<}^{OH}_{CO.ONa} + C_6H_5.ONa + COCl_2 = C_6H_4{<}^{OH}_{CO.OC_6H_5} + 2NaCl + CO_2$$

Salol occurs in small rhombic prisms, or a white tasteless powder having a faint aromatic odor. It melts at 42° to 43° C. It is insoluble in water, soluble in ten parts of alcohol and .3 part of ether. Heated upon platinum foil, it should burn without leaving a residue, otherwise the salol is adulterated with mineral matter.

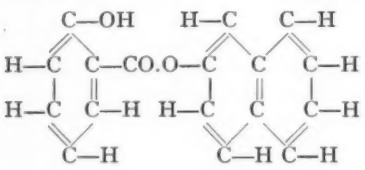
When .5 gramme of salol is dissolved in 5 cubic centimetres of alcohol and 15 cubic centimetres of water, and a few drops of ferric chloride added, it gives a violet coloration, which should vanish after ten minutes, otherwise free salicylic acid or phenol, or both, are present.

Salophen, or salol in which the carbolic acid element with its accompanying poisonous properties has been substituted by another and more useful element, is another patented product which is very commonly used. The reactions for its preparation are very complicated. It



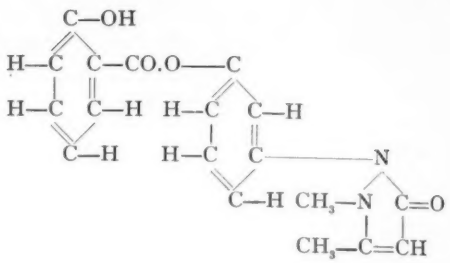
occurs as thin laminar crystals, which are odorless and tasteless and have a neutral reaction. It is almost insoluble in water, soluble in ether and alcohol. It has been used with good results, so reports state, in cases of rheumatism.

Betol, $C_6H_4(OH).CO.OC_{10}H_7$, is analogous to salol, and is obtained from β naphtol in



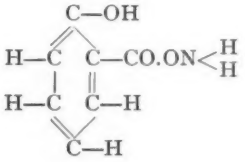
place of phenyl, as is the latter. It occurs in white, odorless, tasteless micaceous scales, melting at 95° C. It is nearly insoluble in water, easily soluble in boiling alcohol (1 to 3), also in ether and benzine, only slightly soluble in cold alcohol. It is an internal antiseptic.

Salipyrin, $C_{11}H_{12}N_2O.C_7H_6O_3$.—It possesses the therapeutic properties of both antipyrin and salicylic acid. In fact, some question has been raised whether it is really a chemical combination or merely a physical mixture. If the former, its constitution is probably as follows:



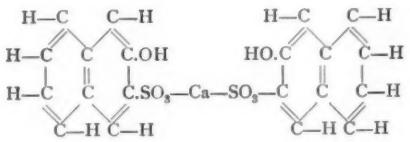
It occurs in coarsely crystalline, white powder, without odor, and having a sweet and pleasant taste. It melts at 91.5° C., and is easily soluble in alcohol and benzole, but difficultly soluble in water (.4 part in one hundred cold and 4.4 parts in one hundred boiling) and ether.

Salicylamide, $C_6H_4(OH).CO.NH_2$, is made from methyl salicylate (artificial oil of wintergreen) by the action of ammonia. It crystal-



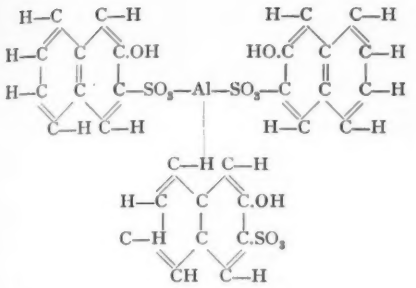
lizes from ether in lustrous yellow plates, melting at 142° C., and can be sublimed when carefully heated. It is moderately soluble in water and is tasteless, but leaves an unpleasant grittiness in the mouth.

Asaprol, $(C_{10}H_6(OH)SO_3)_2Ca + 3H_2O$, is of French origin. It is a powerful antiseptic, made by acting on β-naphtol with sulphuric acid, and then forming the calcium salt of the resulting acid. It is a white, scaly powder,



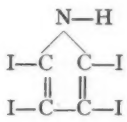
easily soluble in water. It decomposes near 50° C. It is an antiseptic, antirheumatic, and antithermic agent. Growth of the bacilli of Asiatic cholera, typhoid, etc., is prevented by the use of this compound.

Alumnol, $(C_{10}H_6(OH)SO_3)_3Al$, is analogous to asaprol in composition. It forms fine white, non-hydroscopic crystals, which are easily soluble in water, not quite so soluble in alcohol, the solution showing a beautiful fluorescence, and insoluble in ether. A four-per-cent. solution dropped in the eye stops the flow of tears



for several minutes, enabling an easy examination of same.

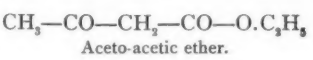
Iodol, C_4I_4NH, is a comparatively old preparation, made by precipitating pyrrol with a potassium iodide solution of iodine. It is a tasteless, pale yellow, crystalline powder,



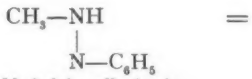
nearly odorless, and decomposed by heat with the evolution of iodine, leaving a bulky charcoal as a residue. It is almost insoluble in water (1 to 5000), easily soluble in alcohol (1 to 3), ether (1 to 1), and chloroform. It contains 88.9 per cent. of iodine. It is an iodoform substitute.

Iodol can be recognized by the green color of its solution in sulphuric acid and by the bright-red color produced when an alcoholic solution is warmed with nitric acid.

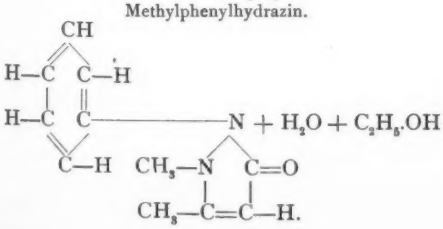
Phenazone, $C_6H_5(CH_3)_2C_3HN_2O$, which has been termed the king of synthetic medical remedies, was discovered by Professor L. Knorr in 1884. It is prepared by heating aceto-acetic ether and methylphenylhydrazin together, thus:



Aceto-acetic ether.



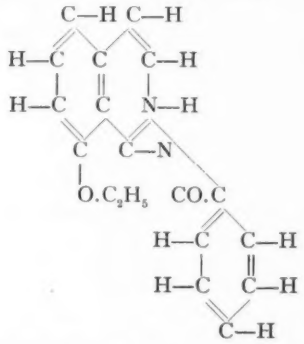
Methylphenylhydrazin.



Phenazone forms colorless and odorless table-like crystals, which have a mild, bitter taste. It melts at 113° C., and should burn without leaving a residue. It is very soluble in water, and then has a neutral reaction.

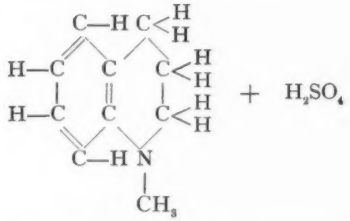
Iodopyrin is similar to phenazone therapeutically, but possesses the advantage of the iodine. It occurs in colorless, silky, needle-like crystals, slightly soluble in cold water.

Analgen, $C_9H_5NO(C_2H_5)NHCOC_6H_5$, is one of the latest analgesics. "Its synthetic composition was thought out before actual production

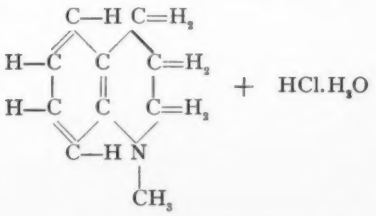


of the compound was attempted, and knowing the activity of the combining agents, the aim was to produce a substance of high physiological power by introducing a definite group of molecules having known pyretic action." Analgen occurs in white crystalline powder, consisting of microscopic needles, which are slightly soluble in water. It has been tried in cases of rheumatism with gratifying success.

Methyl Kairoline, $C_9H_{10}N(CH_3)H_2SO_4$, and the ethyl compound analogous to the former, except that the radical C_2H_5 is substituted for CH_3, were at one time proposed as antipyretics, but, since their action is slow, have been discarded.



Methyl Kairine, $C_9H_{10}NO(CH_3)HCl + H_2O$, is a grayish or yellowish crystalline powder, having an odor somewhat similar to phenol,



and a salty and slightly aromatic taste. It is difficultly soluble in cold water, more readily in hot; difficultly soluble in alcohol, and practically insoluble in ether, chloroform, and carbon disulphide. It melts at 110° C. It has been replaced by antipyrin and other later remedies.

The ethyl kairine is analogous to the methyl product.

Thalline, $C_{10}H_{13}NOH_2SO_4$, is a very efficient and rapid antiseptic, which has been highly recommended in typhoid fever. It crystallizes in rhombic crystals, fusing at 40° C., and possessing a peculiar, pleasant aromatic odor. It is readily soluble in most solvents. Commercial thalline is not the base itself, but its sulphate, which is a yellowish-white powder, melting at 110° C., and is moderately soluble in water (seven parts of cold and half a part of hot), but with difficulty in cold alcohol. Ethyl thalline is similar to the base.

Thalline Tartrate, $C_{10}H_{13}NOC_4H_6O_6$, is a powder similar to the sulphate. It is soluble in ten parts of cold water, three hundred parts of alcohol, and nearly insoluble in chloroform and ether.

NOTE.—The author is indebted to "The Ephemeris" for many details of the above compounds.

ON THE LOCAL TREATMENT OF PUERPERAL FEVER.

CULLINGWORTH thinks that, when all adherent shreds have been removed, it is good practice to, once for all, douche the uterine cavity with a hot antiseptic solution, so as to wash away all the *débris* and completely empty the cavity. The writer's preference is for a solution of corrosive sublimate (1 in 5000) at a temperature of 112° to 115° F. Of this he generally uses about half a gallon. The uterus should be carefully compressed after the douche has been employed, so as to prevent any of the solution from lodging in its cavity, and care should also be taken that none remains in the vagina. Unless these points are attended to, the internal use of corrosive sublimate is dangerous.

It has been recommended to follow up the use of the douche by inserting an iodoform intrauterine suppository. The writer has done this in a few cases; though it did not seem to do any harm, he has never seen it do any good. Another and more recent plan, which has been widely adopted in some countries, is to pack the uterine cavity, after douching, with strips of iodoform gauze. This is said to arrest oozing, to act as a disinfectant, and to promote uterine contraction and involution.

It is usual for the temperature and pulse to rise during the first few hours after intrauterine manipulations of the kind described, but by the next day, in the majority of cases, both temperature and pulse have fallen.

The subsequent progress of the case will depend upon whether it is one of septicæmia or sapræmia. In the latter case the removal of the decomposing *débris* will have effected a cure. In the former case it will not have done that, but it will have removed a probable source of septic absorption and lessened the chances of further infection.

The question may here very reasonably be asked, "Have I carried out this method of treatment in my own practice, and, if so, with what result?" The writer answers the first part of the question by saying that he has for some years been in the habit, when called early into consultation in cases where a persistently high temperature and other symptoms of fever have followed childbirth, of making an intrauterine examination, and that during the five years he has held the appointment of visiting physician to the General Lying-in Hospital any rise of temperature, of more than ephemeral duration, occurring in one of his patients, was taken as indicating the necessity for immediate intrauterine exploration. The startling result of this somewhat large experience is that he can scarcely recall more than one or two cases where he has failed to find small pieces of adherent placental tissue in a condition of incipient or more advanced decomposition. In the great majority of cases the result of clearing out the uterus has been that the fever has disappeared within twenty-four hours; in some the disappearance has been less rapid, and in others, where true septicæmia had already declared itself, the removal of the putrid *débris* has been ineffectual in checking the progress of the disease. But even in these last-named cases it was surely worth while to remove what could not be otherwise than a source of fresh absorption and therefore of continually increasing danger.

The writer commends these suggestions to his professional brethren and confidently urges their adoption, either as a further and more effective resource when the employment of the intrauterine douche has failed to give relief, or, better still, as a preliminary to the use of the douche. The manipulations will no doubt at first prove somewhat difficult, but a very little experience will insure the necessary dexterity.—*Practitioner*, April, 1895.

The Therapeutic Gazette

EDITED BY
H. A. HARE, M.D.,
GENERAL THERAPEUTICS.
AND
EDWARD MARTIN, M.D.,
SURGICAL AND GENITO-URINARY THERAPEUTICS.

GEO. S. DAVIS,
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Leading Articles.

DISINFECTION OF RECENT WOUNDS.

FROM a clinical stand-point there seems to be nothing more certain than that antiseptic surgery has one of its most useful applications in the disinfection of contaminated wounds. The proof as to the efficiency of antiseptics, such as bichloride, as applied to all forms of infected wounds, is so overwhelming that there should apparently be no need of corroboration from the laboratory stand-point. The researches of Schimmelbusch, corroborated by Pfuhl, Renault, Bouley, and a number of others, apparently absolutely disproving the efficacy of any antiseptic, even if this be thoroughly applied within a few minutes of the time of contamination, have been so widely quoted, and have so profoundly impressed a certain number of scientific surgeons, that Henley's paper, in the *Archiv für Klinische Chirurgie*, vol. xlix., 4th section, is timely and important.

Schimmelbusch and his followers, using the anthrax bacillus as the germ of infection and mice as the animals to be experimented upon, proved conclusively that the disease, once inoculated, ran identically the same course, whether the seat of inoculation was or was not immediately disinfected (THERAPEUTIC GAZETTE, June, 1895). Moreover, if the end of the mouse's tail was inoculated and the tail amputated in ten minutes, the mouse still perished of anthrax. The natural conclusion to be drawn from these experiments is, that attempts at disinfection are perfectly futile.

It is clear, however, that the action of anthrax upon mice is by no means similar to that of the ordinary infecting germs of the human, and hence that conclusions drawn from such experiments are not capable of clinical application. The anthrax bacillus at once overcomes cell resistance, probably by the ptomaines it produces, and is taken up by the circulation. The streptococcus and staphylococcus, the ordinary germs of wound infection, act quite otherwise. Their destructive power is far less. They remain strictly localized unless present in overwhelming numbers or representing cultures of unusual virulence. Even under these circumstances a certain length of time is passed before tissue resistance is overcome. It results from this fact that, if the point of infection be thoroughly cleansed and germs cease to multiply here, there will be no systemic infection, a point in which the pus microbes differ radically from those of anthrax, since the latter may, and often do, cause death from systemic involvement, even though the wound of entrance be thoroughly purified and heal *per priamam.*

It was for the purpose of offsetting these experiments of Schimmelbusch and his followers that Henley took up the laboratory study of streptococcus infection. The germs were obtained from erysipelas and plegmons occurring in the human, and were inoculated into the ears of guinea-pigs. In some cases they were rendered excessively virulent by being grown in a succession of guinea-pigs, the spleen pulp of one animal dead of streptococcus infection being inoculated into another animal, and the re-enforcement being so continued. The right and left ear of each animal was inoculated with a cut of the same depth and length, and with a similar amount of the germ-bearing mass. Microscopic sections were in many cases taken to discover the extent to which the germs had spread. One ear was for a varying time from the period of inoculation washed with the bichloride solution of 1 to 1000, the other was either not treated at all or

was washed with distilled water. The results show, almost without exception, that the application of bichloride prevented the development of erysipelas. The ear which was not treated, but simply cleansed with water, after thirty or forty hours became swollen, red, and infiltrated, presenting all the symptoms of a local erysipelas. Microscopic section showed wide diffusion of the germs. The disinfected ear remained normal without reaction, saving that which comes from the healing of a clean wound. Microscopic section showed complete absence of germs. Beginning with disinfection carried out a few minutes after the infliction of the wound, and lengthening the intervals, Henley found that if bichloride is carefully employed three hours after infection, even though the most virulent form of streptococci have been inoculated, the wound remains reactionless. In some cases, when cleansing was not attempted for eight hours, erysipelas did not develop, or, if it did, was milder and slower in its course.

The microscopic sections showed that for the first four hours the germs remained strictly localized; after this they began to penetrate into the lymph-spaces, and were found at some distance from the surface of the wound, hence beyond the action of even powerful disinfectants. As to the clinical application of these facts, it is clear that the value of the antiseptic treatment of recent wounds is thoroughly corroborated by laboratory research, and to be effective the antiseptic must be applied as soon as possible after the infliction of the wound, and must penetrate to its deepest part; that there should be no hesitation in enlarging wounds when necessary to allow of thorough application of the disinfectant to all its portions; that crushed, bruised, and ragged portions of tissues should be removed by the knife or scissors, as representing tissues of such low vitality that they offer no resistance, but rather a favorable food for the multiplication of germs. But even if the wound is two or three hours old, the surgeon may fairly hope by thorough application of his antiseptics to avoid suppuration.

These experiments would seem to indicate that some change is required in the technique of first aid dressings. The direction usually given to those who are liable to be called upon to apply such dressings, or to surgeons who are called in for the emergency treatment, is that an antiseptic or aseptic occlusion bandage should be applied. This is probably sufficient where the wound can be subjected to cleansing within one or two hours. Where, however, it is probable that a wound will not be so treated for many hours, as, for instance, when a patient has to be transported for a long distance, those who administer first aids should certainly be instructed in the proper method of thorough flushing with bichloride solution, 1 to 1000. The tablets for making such a solution are readily kept and carried, and sufficiently pure water is nearly always at hand.

Schimmelbusch's paper has been widely quoted by the adherents of aseptic surgery. Henley's research, which has been amply corroborated by other experimenters, thoroughly answers the arguments based on the deductions drawn from Schimmelbusch's experiments.

THE TREATMENT OF SUNSTROKE.

DURING the past ten or fifteen years the medical profession has passed through a period in which its chief aim and desire seemed to be the reduction of febrile temperatures, and the belief was almost universal that in the presence of a febrile process antipyretic measures of more or less activity should always be resorted to. The few who imagined that febrile movement was not always injurious—who went further, and asserted that it might at times be distinctly beneficial in limiting the processes of infection—were swept aside by the enthusiastic majority, who hailed the advent of each new drug or antithermic measure with delight. As we have pointed out in earlier editorials, the history of medicine has many instances in which great enthusiasm has developed the usefulness of certain drugs, not in the line for which they were generally introduced, but for purposes quite different, as, for example, the salicylates in rheumatism, or other coal-tar products which we now use for the relief of pain. Now we recognize fever as a danger only where excessive or prolonged beyond reasonable limits.

There is one febrile process, however, which still remains to be rightly considered distinctly dangerous, simply because of its excessive pyrexia,—namely, thermic fever,—a condition in which the balance between the manufacture and dissipation of heat is entirely undone, with the result that vital organs sustain irreparable injury through exposure to excessive temperature. Even this fever, however, does not seem to be properly controlled by the use of antipyretic drugs, for in the majority of cases in which they have been employed they have failed to be of sufficient benefit when given in safe dose. The only method, therefore, by

which the excessive fever of sunstroke can be controlled is the use of the cold bath in its most active form, since the disordered heat mechanism of the body necessitates anything but temporizing measures. The same active friction of the skin is necessary during the cold bath for thermic fever as is employed in the Brand treatment of typhoid fever for the purpose of bringing the hot blood from the centre of the body to the periphery, and it is of the utmost importance that while the patient is being immersed or sponged with ice-water a still colder application be applied to the entire head in order to prevent fatal cerebral congestion.

We believe that an equally important therapeutic measure in the treatment of sunstroke by cold sponging is venesection, which should be free and copious, and is particularly indicated in those cases in which there is much cyanosis or convulsions. Convulsions are, perhaps, a more frequent complication of sunstroke than is generally imagined. This is recognized by those who have seen many of these cases, and pointed out statistically by Withington in the *Boston Medical and Surgical Journal* of May 23, 1895, who, out of one hundred cases of sunstroke, records thirty as having convulsions. Of the twenty-eight fatal cases in one hundred recorded by him, thirteen had convulsions, which were sometimes local or general and characterized frequently by marked opisthotonos.

Another point of very great importance in the treatment of these cases is the recollection that secondary and tertiary rises of temperature frequently occur. Not only does the fever often return at once, so that, using a term frequently applied to hemorrhage, it is "consecutive," but often, after the temperature has been normal for some hours, it will suddenly shoot up and remain persistently high, forming what might be called a secondary fever. Last of all, the physician should remember that, in the event of severe headache during convalescence from sunstroke, venesection is of the greatest value for the purpose of overcoming the low grade meningitis which may exist, and care should be taken that no drug which tends to produce cerebral congestion should be given, such as quinine, for the relief of fever or for its tonic influence.

In an article in the *New York Polyclinic*, Page states that during the period of convalescence, if the pulse be bounding, veratrum viride and bromide of sodium are useful, and, if the pulse be weak, that ergot should be given. He also suggests counter-irritation to the nape of the neck where evidences of meningeal irritability exist.

Comparatively rarely in sunstroke two conditions arise which may render the diagnosis difficult,—namely, that state in which the surface of the body becomes icy cold, when, in reality, the central organs are fiery hot, as is shown by the temperature taken high up in the rectum. Under these circumstances the physician must relieve the central temperature by high injections of cold water into the colon, thereby reducing the heat and driving the congested blood to the surface of the body. The second point for diagnosis is heat exhaustion, in which there is an unusual fall in bodily temperature to below the normal in place of the ordinary rise. In such a case hot injections or baths may be required. They may also be needed when, through inadvertence or accident, cold bathing has been pushed so far in thermic fever as to cause collapse.

THE DIGESTION OF STARCHES.

AS is well known, the food-stuffs taken by human beings can be divided into those which we call proteids, carbohydrates or starches, and fats. Each of these divisions is necessary for the maintenance of perfect nutrition, and just as soon as, from one cause or another, a person excludes one of these classes from his diet, he begins to suffer from nutritive changes, which become more severe as the deprivation is persisted in.

Recognizing the fact that indigestion can often be relieved by the administration of animal digestive ferments, we have had introduced into medicine within the last few years pepsin and pancreatin for the purpose of aiding in the digestion of proteid substances. While, theoretically, extract of pancreas ought to be equally efficacious in the digestion of proteids, starches, and fats, the clinical fact remains that the last two important classes of food-stuffs are little influenced by it. As a result, while we are able to deal satisfactorily with those forms of dyspepsia depending upon gastric disorder, we can do little in the intestinal forms of dyspepsia, which arise largely from indigestion of the starches. It is true that in many instances deficient insalivation is the prime cause in cases of so-called starch dyspepsia, but there are other instances in which it is evident that the diastatic or starch-converting activity of the duodenal juices is at fault. In some

instances the physician has attempted to supplant the ingestion of starches, and so to put fat upon his patient by the use of cod-liver oil, but, as a rule, the administration of this nutritious substance only increases the intestinal disorder.

Diastatic power is an indefinite term applied to any ferment which is capable of converting starch into grape-sugar or glucose, and physiologists have recognized for many years that this power must be present for the proper digestion of starches.

In the THERAPEUTIC GAZETTE for November 15, 1892, we urged the importance of discovering some substance possessing diastatic properties which could be administered in concentrated form to persons suffering from indigestion of the starches, and since that time we have continued to urge this need upon those best qualified to prepare such an active digestive substance.

The profession have tried to aid the digestion of starch for many years by the use of various preparations of malt, which have been largely given with little direct good as a result, for the diastatic properties of most of these preparations are so slight as to render them practically of no value as digestants, whatever may be their usefulness when acting as nutritives. Within the last few months a Japanese investigator has obtained such a valuable diastatic product that his researches deserve careful study and his results thorough trial. If, as he has apparently proved (see Lascar's original article in this issue of the GAZETTE), we possess in Taka Diastase a starch digestant equal to or exceeding in power pepsin or pancreatin for proteids, we have made an extraordinary gain in therapeutics, for we are now able to relieve a large number of persons suffering from faulty digestion of starch, and can aid our patients, during convalescence, so that they speedily regain their weight and strength by the ingestion of large quantities of the heretofore indigestible, but nevertheless very necessary, starchy foods.

We trust that the readers of the GAZETTE will at once give this interesting ferment, which is capable of converting over one hundred times its own weight of starch, a thorough clinical trial, administering it in the dose of from 1 to 5 grains, which is best given in powder, or, if the patient objects to the powder, in capsule. We also trust that those who employ this digestant will, as soon as they obtain definite results, communicate them to the original columns of the GAZETTE for the benefit of other readers.

ANOTHER ABORTIVE TREATMENT FOR GONORRHŒA.

IN an article in the *Medical Press and Circular* is given a somewhat surprising communication, purporting to represent the teachings of Routier in the Necker Hospital. This surgeon is made to state that he has treated twenty-five cases of gonorrhœa, eight in the acute stage, and cured all by daily irrigations with permanganate of potassium, strength 1 to 2000, continued for one to two weeks. As a test as to the certainty of cure, a few drops of a one-per-cent. solution of nitrate of silver are instilled; if any gonococci have remained, it is stated that a drop of pus will be found in the morning. This communication is so obviously absurd and misleading that it is to be hoped it may be speedily corrected.

Reports on Therapeutic Progress.

THE EMPLOYMENT OF GLYCERIN FOR INDUCING LABOR.

In *Lo Sperimentale*, P. L. FERRARI, in the first place, refers to the recent observations on this subject by Pelzer and Pfannenstiel, and, after giving a short outline of the cases published by Clifton, Simpson, Jennet, Müller, and the two aforenamed, proceeds to describe the result of his own experience. A woman, aged thirty-seven, had been pregnant ten times. Thrice she aborted, and none of the other children lived more than a few days, some having been extracted by instruments. Being desirous of having a living child, induction of labor at the beginning of the eighth month was suggested, and for this purpose she came into the hospital. Vertex presentation was diagnosed, and cicatrices were felt involving the uterus. Moreover, the pelvis was narrowed, as the result of rickets. As during the course of several days only slight pains were induced through douches and the insertion of a catheter, glycerin was suggested. Ten cubic centimetres of the sterilized liquid were carefully injected, and the operation was immediately followed by general malaise, the predominant symptoms being præcordial pain, rigors, cyanosis, dyspnœa, and a small pulse. While persistent treatment led to some alleviation, nausea, diarrhœa, and hæmaturia set in. The fœtal heart increased from 130 to 160. Towards evening the patient was somewhat better, but the fœtal heart was inaudible and uterine contractions intermittent, and dilatation of the os was very slow. Dilatation by

colpeurinter was successful, and the child, being dead, was removed after embryotomy. After delivery the patient grew worse, and a swelling was felt in the right iliac fossa. She soon succumbed, and the autopsy revealed parenchymatous nephritis and intrapelvic hemorrhage. While reverting to the published cases, the author remarks that in the three cases where nephritis existed the issue was fatal. Ferrari has under the microscope observed the deleterious effects of glycerin upon the red corpuscles, and confirmed the same by experiments on animals. The subcutaneous injection of the drug induced hæmoglobinuria, anæmia, and nephritis, and the author points out that the fœtus is liable to the same dangers as the mother, either from glycerin absorbed or from excessive contractions. He concludes (1) that glycerin injected into the uterus does not possess a constant and reliable action, nor does it produce a certain result; (2) that it is dangerous, owing to the changes which it produces in the blood and kidneys, and should on no account be used when the latter are diseased; (3) death of the fœtus also may result. —*Practitioner*, March, 1895.

TAPPING THE PERICARDIAL SAC.

Referring to Dr. Gordon Sharp's case of paracentesis pericardii, recorded in the *British Medical Journal* of March 23, WEST thinks it deserves comment: first, because of the peculiar place selected for puncture; secondly, because of the benefit derived from the removal of an infinitesimal amount of fluid; and, lastly, on account of the conclusions which Sharp draws.

The third intercostal space near the sternum is theoretically about the most dangerous place to choose for the operation, for the heart can never be far away from the chest-walls here; and though in the prone position the heart generally falls away from the sternum, still, this is not always so. Still, general rules must be modified to suit individual cases, and there were, no doubt, in Sharp's case, the best of reasons for selecting the place chosen. West has tapped the pericardium several times in unusual places, but he always attacks the region near the base of the heart with misgiving and with extra care.

The improvement which followed the removal of only a few minims of fluid in Sharp's case cannot be referred to any relief given to the pressure on the heart. This must fall into that curious category of cases in which a single dry puncture is followed by improvement without any obvious cause. The writer has seen this happen so many times, both in the case of the pleura and of the pericardium, that it cannot be a simple coincidence. What explanation to give to it is another question.

With the conclusions drawn by Sharp—that pericardial effusions of rheumatic origin do not, as a rule, require paracentesis—West agrees. He has seen very large effusions spontaneously disappear almost as rapidly as they developed. For all that, paracentesis will be necessary in some instances, and in a large number of cases in which paracentesis pericardii has been performed with success the effusion has been of rheumatic origin. The use of the ordinary trocar and canula of the aspirator in the position selected would be attended with extra risk. In the only fatal result West has seen, though not a case of his own, the puncture was made in this place with the ordinary trocar and canula. The trocar, which projected, as usual, about one-third of an inch beyond the canula, reached the heart, tore a hole in it, and the patient died from hemorrhage into the pericardium within a few minutes of the operation. An aspirator is hardly ever necessary for paracentesis pericardii, for the fluid is under pressure and flows away readily enough. A sharp hollow needle is much to be preferred to any form of trocar and canula. Such a needle can be passed quite easily and quietly through the chest-walls without any undue force, and is much more under control than any trocar and canula can be, for this often sticks at the collar at the end of the canula, and requires so much force to drive it through that it is likely to jump and go farther in than is intended. This is what occurred in the case referred to; though the canula was only well within the sac, the trocar reached the heart and caused laceration in the left auricle. The writer has never had such an accident himself, because he has always used a sharp hollow needle, and gone very steadily and carefully to work.—*British Medical Journal* for March 30, 1895.

ANTISEPTIC METHODS IN MIDWIFERY.

The *London Practitioner* for March, 1895, tells us that at Queen Charlotte's Lying-in Hospital, London, the following antiseptic measures are adopted:

The patient, on admission to the hospital, before entering the labor ward, is washed from head to foot and clothed in garments provided for the purpose.

On entering the labor ward, before any vaginal examination is made, the vulva and surrounding parts are thoroughly washed with soap and hot water, and, the soap having been removed with plenty of water, the vagina and vulva are irrigated with a solution of perchloride of mercury, 1 in 2000.

The importance of keeping the hands clean and free from scratches and the nails short is pointed out. Before any examination is made, any rings worn are to be removed and the hands well washed with soap and water and scrubbed with a nail-brush. The hands are then immersed for not less than one minute in a solution of perchloride, 1 in 1000. As a lubricant, vaseline and perchloride (1 in 1000) is used, and the jar containing it is kept permanently immersed in a basin of 1 in 1000 perchloride solution.

When delivery is completed, a warm vaginal douche of 1 in 2000 is given to all patients.

Forceps and other instruments, before being used, are boiled in water in a vessel resembling a fish-kettle in shape.

The solution of perchloride of mercury is made from ordinary tap-water, and no acid or other substance is added, except some coloring material.

At the General Lying-in Hospital, London, where the antiseptic methods adopted have met with so large a measure of success, the rules are much the same as those above mentioned. The vulva is cleansed, and a vaginal douche is given before and after delivery.

The lubricant employed consists of glycerin and perchloride, 1 in 1000.

A small quantity of hydrochloric acid is added to the mercurial solution.

At St. Mary's Hospital and at the Manchester and Salford Lying-in Institution the methods are as follows:

The nurses are taught to thoroughly cleanse the hands with soap and water and turpentine, and then to soak them in a solution of perchloride of mercury (1 in 1000) for five minutes.

The vulva is always cleansed with soap and water, and then with the mercurial solution, 1 in 1000; but if vaginal evidence of septic discharge exists, as, for example, in cases where there is profuse leucorrhœa or evidence of vulvitis, a douche is given. It is, moreover, given in cases where operative measures are to be undertaken.

The lubricant used is glycerin and perchloride of mercury, one grain to the ounce.

After delivery a douche of perchloride of mercury (1 in 6000) is given in all cases.

At the Rotunda Hospital, Dublin, the following plan is adopted:

The vulva of every patient is washed with soap and then with lysol solution at the commencement of labor. It is believed that this hardens the tissues less than corrosive sublimate.

A vaginal douche is not given either before, during, or after labor in uncomplicated cases, nor during the puerperium.

Four vaginal examinations are all that are allowed during the entire course of a normal labor.

The hands are carefully scrubbed with soap and water and a nail-brush, and the latter is kept constantly immersed in a creolin solution, and, as an additional precaution, is boiled once a week. All soap having been washed off, the hands are soaked and scrubbed with a special brush for one minute in a solution of perchloride of mercury (1 in 500) to which some tartaric acid has been added.

The hands are not dried before examining, and no lubricant is used under ordinary circumstances. If, however, the hand has to be passed into the vagina, then soap is the lubricant preferred. Carbolic soap is usually employed, but no stress is laid on this, as ordinary soap, when once its surface is melted off by hot water, may be regarded as an aseptic substance.

Before obstetrical operations the vulva is scrubbed with sterilized tow, soap, and creolin solution, two per cent. The vagina is scrubbed out in the same way with soap and the two-per-cent. creolin solution.

Professor Tarnier, late surgeon to the Maternity at Paris, recommends the following plan:

The hands are washed and scrubbed with a nail-brush in a solution of 1 in 4000 perchloride of mercury, soap being used. The depression around the nails is cleansed with a wet cloth, and the hands are then washed in alcohol, and are then steeped in a perchloride solution. The advantage of washing the hands in alcohol is that by this means the fatty substances are removed from the skin, and so the antiseptic has a better chance of penetrating.

A vaginal douche of perchloride of mercury is always given before and after delivery, and the greatest care is exercised in cleansing the vulva.

At the termination of labor an intrauterine douche of iodine and water is given in all cases, the following formula being the one employed:

℞ Tinct. iodi., fʒi;
Potassii iodidi, ʒiss;
Aq. destill., Oii.
Ft. lotio.

Instruments are sterilized in a specially devised dry-heat sterilizer.

The following solution, known as Van Swieten's fluid, is the preparation of mercury which is employed:

℞ Hydrarg. perchlor., 1 part;
Alcohol, 100 parts;
Aq. destill., 900 parts.
Misce et ft. lotio.

This lotion is diluted with four times its bulk of water before use, so that the strength becomes 1 in 5000. He believes that this is less toxic than mercurial solutions made with tartaric acid.

Professor Winckel, of Munich, recommends the following:

The genitals should be washed with a three-per-cent. solution of carbolic acid and then dried with salicylated cotton-wool.

He considers that vaginal injections before delivery are not necessary in all cases, but when given carbolic lotion of the strength mentioned above should be used.

The hands and arms after washing should be soaked either in a three-per-cent. solution of carbolic acid or a solution of perchloride of mercury, 1 in 1000.

It will be observed that the methods described above admit of being divided broadly into (1) methods for disinfection of hands and instruments, and (2) methods for disinfection of the patient. It is universally acknowledged that the preliminary and most essential step is to thoroughly cleanse the hands with hot water, soap, and a nail-brush and after this has been done the hands are immersed in an antiseptic solution for at least a minute, this immersion being repeated before every subsequent examination of the patient. It is difficult to enforce an immersion of longer than a minute. The most widely used of the modern chemical antiseptics is perchloride of mercury, and for the hands nothing better can be desired. It is a powerful germicide, it is portable, and it is cheap. A solution of from 1 in 1000 to 1 in 2000 is commonly employed, although Tarnier and Vignal have shown that the streptococcus is destroyed as easily by a solution containing 1 in 5000 as by one containing 1 in 1000. If mixed with ordinary tap-water, the lime salts which are present in solution react upon the perchloride of mercury, and some of it is thrown down as an insoluble oxide; so that, if no precautions are taken to prevent this, a certain amount of perchloride is lost. If, however, a solution of the proportion of 1 in 2000 be used, the amount of perchloride precipitated by the lime salts in the water will probably not be sufficient to seriously interfere with its efficiency as a germicide, always supposing that the solution is freshly made. To prevent the partial decomposition of the perchloride, distilled water has been used, or, failing this, various substances have been added which counteract the effect of the lime salts and render the solution of perchloride stable. A solution of perchloride of mercury in distilled water could hardly be employed, except at a lying-in hospital, and even there it would involve considerable trouble and expense, so that the other plan of rendering the solution stable by the addition of certain chemical substances to the water is more generally used. Of these substances, tartaric acid or chloride of sodium are the most convenient, the amount added being double that of the perchloride. In hospital practice it is customary to have a concentrated acidified solution of the strength of 1 in 200 made; but for use in private practice powders having the following formula may be carried:

℞ Pulv. hydrarg. perchlor., gr. x;
Pulv. acidi tartarici, gr. xx;
Cochineal, gr. i.
Misce et ft. pulv.

One of the powders added to a quart of water makes a solution of 1 in 2000. Chloride of sodium may be substituted for tartaric acid, and tabloids containing chloride of sodium and perchloride of mercury are now sold, and are very easily carried. The addition of some coloring-matter is advisable, as the solution has neither taste nor smell. It must be remembered that a solution thus prepared is rendered inactive by admixture with soap or any albuminous material; so that the hands, if soiled with blood or other discharges, should be thoroughly wiped before being plunged into the mercurial solution. If, however, care be taken, a solution prepared at the commencement of labor will last until the termination of it. The chief advantages which perchloride of mercury possesses over carbolic acid as a disinfectant for the hands is its greater portability and greater cheapness. There are numerous other antiseptics which are used for the hands, but of these it is unnecessary to speak, because none are so simple, so easily managed, and so effective as perchloride of mercury. To disinfect the forceps, the simplest plan is to boil

them. Metal instruments should not be placed in a mercurial solution, as metallic mercury is deposited on them, which not only weakens or destroys the germicidal properties of the solution, but also dulls the surface of the instrument.

At all lying-in hospitals the importance of cleansing the vulva is recognized, and the method of doing it does not vary very widely. Washing with soap and water, followed by thorough swabbing with a solution of corrosive sublimate, is the best plan, and the nurse should be instructed to do this as soon as labor sets in. It is obvious that unless this is done, microbes, either putrefactive or pathogenic, will be introduced into the vagina, although every care has been taken to disinfect the hands. During the course of the labor the vulva should be sponged from time to time with cotton-wool soaked in the antiseptic solution. The necessity for the routine employment of an antiseptic vaginal douche at the commencement of labor is not universally recognized, and, though it is used in many, it is not used in all lying-in hospitals, unless special indications are present. At any rate, the routine disinfection of the vagina is much less essential than the routine cleansing of the vulva, because in the former situation pathogenic microbes are rarely met with, whereas in the latter situation such organisms are common. The employment of a vaginal douche would, therefore, seem to be, to a large extent, optional, though it may be pointed out that, besides the additional safety which it offers the mother, it possesses the further advantage of diminishing the risk of purulent ophthalmia in the infant.

In lying-in institutions, where the patient is often examined by more than one person, the use of an antiseptic douche after delivery is completed is a wise precaution, but in private practice it cannot be regarded as necessary, especially if the examinations made have been few and the labor has not been instrumental.

The lubricant used is either vaseline containing perchloride of mercury in the proportion of 1 in 1000, or glycerin containing the same substance in the same proportion. Vaseline is a much more efficient lubricant than glycerin, and its only disadvantage is that, being insoluble in water, it is not easily washed out of the vagina afterwards; but, if only small quantities are used, this is a matter of no importance. In many cases it is quite unnecessary to use any lubricant at all, and under no circumstances should lard or such like material be employed. It becomes apparent, on considering the details of the antiseptic methods of midwifery, that the two fundamental points are thorough disinfection of the hands and thorough disinfection of the vulva. To these two all the other details are subsidiary, and are to be regarded as additional precautions,—precautions, it is true, which in many cases cannot afford to be neglected, but still of distinctly secondary importance. Attempts to make antiseptic methods too complicated and too elaborate often end in their being discarded altogether, with the result that the patient is exposed to grave risk, either of death or of serious and protracted illness.

Although many will be at once inclined to agree that precautions such as these are right and easily managed in lying-in institutions, yet how to carry them out in private practice is a matter of much greater difficulty. We would suggest the following routine procedure, which is not unnecessarily complicated, and is easily carried out if a competent nurse is in attendance. Before full term is reached an order should be given to the patient to procure a packet of absorbent cotton-wool, an ounce of sublimated vaseline (1 in 1000), and twelve powders prepared according to the formula given above, or, if preferred, at least two quarts of carbolic lotion (1 in 20). The nurse is instructed that, as soon as the labor pains begin, she is to wash the patient's vulva with soap and water, and then thoroughly sponge it with cotton-wool soaked in the antiseptic. A fresh supply of the antiseptic solution is then to be prepared and placed on a table by the side of the patient's bed, together with the jar of vaseline, so as to be in readiness for the doctor when he arrives. Before making any examination the hands are washed with soap and water and then immersed in the antiseptic solution at the patient's bedside. The vulva should be sponged from time to time with pledgets of cotton-wool soaked in the antiseptic.

After labor is over, and during the puerperium, three basins should be placed side by side on the wash-stand and permanently kept there. The first is to be used for washing the hands in when necessary; the second is used to contain a solution of perchloride of mercury, which is freshly prepared each morning by the addition of one of the powders to a quart of water. The third basin likewise contains a solution of the perchloride, and in it are kept the glass vaginal tube and catheter; but, if douching is not employed, the third basin is not necessary. The nurse is instructed to soak her hands in the solution contained in the

second basin before doing anything for the patient which involves contact with the genital organs. If this plan is insisted on and explained to the nurse, there is no reason why in most cases in private practice antiseptic precautions should not be carried out as efficiently as within the walls of a well-managed hospital.

It should never be forgotten that all the knowledge of the accoucheur goes for nothing if he be not imbued with the antiseptic method.

LARYNGEAL TUBERCULOSIS: LOCAL APPLICATIONS.

In the *Medical Record* for April 6, 1895, GLEITSMANN gives us directions as to the treatment of this difficult state.

Although careful attention to the general condition of a patient suffering from laryngeal tuberculosis is indispensable, he does not touch upon this part of the treatment, but speaks of the local treatment only. Disinfecting and anodyne sprays and insufflations are extensively used up to the present day. Intralaryngeal injections of twenty per cent. menthol in an oily solution were first practised by Rosenberg, and lately an addition of two per cent. of guaiacol to the menthol solution is well spoken of by English authors. In the opinion of the writer, the best results in laryngeal ulceration—aside from curettage—are obtained by the proper and judicious application of lactic acid. In making this statement we must not lose sight of the fact that in laryngeal tuberculosis we have to deal with a most intractable disease, and which until lately was generally regarded as incurable. As isolated cases of a spontaneous cure are known to occur, and as relief can be afforded and even an apparent cure effected by different remedies, a long period of observation of the patient and an extended trial with the remedy mentioned is necessary in order to become convinced of its efficacy. Very appropriately, Gottstein says in the last edition of his book on diseases of the larynx, "The physician who discards lactic acid after a few unsuccessful trials will not be able to form an unbiassed judgment; only one who uses the method systematically for a longer time will achieve better results with it than with any other method of treatment."

For the introduction of the acid special instruments have been devised, but an ordinary good laryngeal cotton-carrier will answer the purpose. The acid must be rubbed into the ulcer with a moderate degree of force, and the strength of the solution employed should be gradually increased from twenty to seventy-five or eighty per cent., or even the full percentage. As a rule, an eschar is formed, which, when exfoliated, leaves a clean ulcer showing a tendency to cicatrization. Contraindications are a high degree of hectic, far-advanced destruction of lung-tissue, or extensive ulcerations of the lower larynx and trachea.

The connecting link between local applications and surgical treatment is submucous injection. As lactic acid is only efficacious in the treatment of ulcerations, and does not act on parts covered by intact mucous membrane, infiltrations must be treated in a different manner, and they can be reduced by submucous injections. Quite recently such injections with an oily solution of creosote, two drachms to the ounce, have been highly lauded by Dr. Chappell, and if further experiments confirm his results, we shall have in creosote a fair rival of lactic acid for this purpose. There is a difference of opinion as to the length of time which should be allowed to intervene between each injection, as well as to the strength of the solution. In the writer's cases he had the best results from injections of 5 to 8 drops of a fifty-per-cent. solution of lactic acid, which were not repeated until the usually large eschar had sloughed away; this it generally does in from six to ten days. Although ingeniously constructed syringes for this purpose are in the market, an ordinary good syringe, with a properly curved laryngeal attachment and a good point, accomplishes everything that is desired. He has found injections most useful and beneficial in large, club-shaped thickenings of the arytenoids, giving rise to distressing dysphagia, and in such cases he prefers them, as a rule, to either curettage or excision, as the latter are much more trying and painful to the usually weak and emaciated patients.

We now come to the surgical treatment, which is threefold, consisting of either incision, curettage, or excision. The idea of surgical treatment in laryngeal tuberculosis emanated from the reports of the good results obtained by surgeons in the treatment of tubercular affections in more accessible regions of the body. Incisions into the infiltrated parts, especially in the region of the epiglottis and the aryepiglottic folds, were first practised by Moritz Schmitt, who observed lessening of the infiltration and subsequent relief in a number of cases. Curettage and excision, by far more frequently employed, especially on the Continent, were first practised by Heryng, who, in conjunction with Krause, worked indefatigably to improve this method. Curettage

is indicated in ulcerations, while excision is better adapted for infiltrations. By the former the ulcerations are scraped until the diseased tissues are entirely removed, and then lactic acid or iodoform is applied. By excision the infiltrated parts are cut away until healthy tissue is reached.

For operations in the subglottic space, Scheinmann's forceps is an excellent instrument. The contraindications to surgical treatment, as enumerated by Heryng, are: advanced pulmonary disease, diffuse miliary tuberculosis of the larynx, severe stenosis of the larynx, when tracheotomy is indicated, and, lastly, irritable, distrustful patients, who lack the necessary fortitude and perseverance.

It would carry us too far to speak of the technique of operating, or to enter into the literature and controversies which this treatment has elicited among different writers. Suffice it to say that Heryng, who undoubtedly has the largest experience, has treated in this manner two hundred and sixty-eight cases from 1887 to 1894. Of this number, twenty patients were cured; in eight of these the cure has lasted over four years, in eight over two years, and in four over one year; altogether about 13.5 per cent. Although the number of cures may appear to be extremely small, it must not be forgotten that by this treatment many distressing symptoms can be alleviated and even permanently relieved, although the patient may die later on. Laryngeal tuberculosis is so fatal a disease that we can congratulate ourselves if we succeed in curing even a very small percentage of our cases. One of the writer's patients shows the destructive lesions of the larynx and the pharynx as they appeared when the disease had reached its climax. He is now strong and well seven years after the disappearance of the disease.

CAFFEINE IN DISEASES OF THE RESPIRATORY ORGANS.

SKERRITT, in the *Practitioner* for April, 1895, states that, in his practice, caffeine has long held the first place in the treatment of the paroxysm of spasmodic asthma, and it is his conviction that the drug is deserving of much wider recognition than it has hitherto obtained in the management of this intractable and erratic complaint. Success does not always attend its use, but its failures are, perhaps, fewer than those of any other remedy, and again and again has it happened that when drug after drug and specific after specific have proved unavailing, caffeine has afforded relief. This is also the experience of many of the writer's medical friends to whom he has suggested a trial of the alkaloid, some of whom have indeed informed him that they have gained much credit with their patients through their success in cases that have previously obstinately resisted treatment. A letter received within the last few days states that "the caffeine acted on the asthma like a charm," and there are many asthmatics who resort with confidence to the remedy that experience has shown to have more influence than any other over their troublesome malady.

As with other therapeutic measures in this disease, no absolute rule can be laid down with regard to the class of case in which the administration of caffeine is likely to be successful, or the reverse; but it appears to act with more certainty in adults than in children. As would also be anticipated, a good result is more likely to be obtained when there is an absence of sources of peripheral irritation, such as the existence of dyspepsia or of nasal polypi; but here, again, no definite line can be drawn, as in some instances of digestive asthma the relief afforded by caffeine is marked. Benefit is usually most conspicuous in patients whose paroxysm is wont to commence in the early hours of the morning, waking them from sleep.

With regard to dose and mode of administration, the writer is in the habit of prescribing the citrate of caffeine, and the average adult dose is 5 grains, which can be taken either in a cachet or dissolved in water. When a paroxysm of asthma is present, 5 grains are ordered every four hours until the bronchial spasm is relieved, after which the remedy may be given at longer intervals to avert any tendency to relapse. In the case of patients whose attack comes on fairly regularly in the early morning, a dose of 5 or 10 grains at bedtime often suffices to avert the paroxysm, or, at all events, to render it so slight that the patient is able to sleep through it, and wakes in the morning with some sensation of tightness in the chest, which a further dose or two of caffeine removes; but if the asthmatic attack wakes the patient in spite of the evening dose, he takes 5 grains immediately, and again in an hour, two hours, or at longer intervals, as may be necessary to subdue the spasm. The effervescing hydrobromate of caffeine is inconvenient for use, as it contains only one grain of the drug to the teaspoonful, and consequently the quantity requisite to convey the dose of 5 grains is large. The writer has not had occasion to administer caffeine by hypodermic injection.

The influence of caffeine in relaxing spasm is not limited to bronchial asthma, but is also ex-

erted in any morbid condition in which muscular contraction of the bronchial tubes is a factor, and it is proportionate to the amount of such spasm present in any given case. Thus, in acute bronchitis, when the existence of dry râles, or rhonchi, is partly the expression of narrowing of the tubes from contraction of the muscular fibre in their walls, and partly due to inflammatory swelling of the lining membrane, the remedy in question will tend to cause relaxation of the spasm, and consequently relieve dyspnœa in so far as it is due to this element; while, on the other hand, there will be no change in the physical signs and accompanying symptoms which are the expression of tumefaction of the mucous membrane or of the presence of secretion in the bronchial tubes. Similarly there is often an element of true spasm in chronic bronchitis and emphysema, and upon this caffeine will be found to exercise a beneficial influence, allowing of greater freedom in the passage of air, and thus relieving dyspnœa and adding much to the comfort of the patient.

FORMOL IN THE TREATMENT OF PURULENT OPHTHALMIA.

FROMAGEL, in the *Annales d'Oculistique* for February, 1895, in a paper on this topic, reaches the conclusion that treatment with formol has afforded him notable results.

All the children treated by the writer at the Maternity recovered, and where corneal lesions already existed they did not increase.

Can it be said that the use of nitrate of silver would not have produced as good results? By no means; indeed, it would have acted in the same way. But to acknowledge that the results produced by formol can be compared to those of the nitrate is to affirm at the same time the value of formol.

The author also treated a young girl, seventeen years of age, attacked with purulent ophthalmia, with formol. The disease was hardly twenty-four hours old, and the results were very satisfactory.

It was not successful, however, in two cases of blennorrhœic ophthalmia in adults. These two patients lost their sight from complete ulceration of the cornea, with perforations. These are the two failures he records.

These last results are certainly not brilliant. But it is to be admitted that, in spite of the most energetic treatment with nitrate of silver, eyes are not infrequently lost, and that speedily. The most serious purulent ophthalmias are those of blennorrhœic origin observed in adults, while the majority of ophthalmias of the new-born are far more benign.

Formol is an excellent antiseptic. It is preferable to sublimate, which rusts the instruments, and is, as the majority of oculists find, harmful to the cornea. Phenic acid cannot be used. Boric acid possesses hardly any antiseptic power and its use is disappointing.

Nitrate of silver in solution is very rapidly altered by light and by contact with instruments.

The action of permanganate is far from satisfactory.

Formol is not altered by light, it does not rust instruments, it is antiseptic, and presents but a single disadvantage,—that of being painful in strong solution; for example, 1 to 200. But in the proportion of 1 to 2000 it is well borne and produces no pain.

If now we were to make deductions, they would be as follows:

Nitrate of silver remains the leading antiseptic in purulent ophthalmia; it should be used in the solution 1 to 30, or in the crayon, and the cauterization should reach the conjunctival folds.

These applications should be made by experienced hands, through fear of causing corneal ulcerations which might open the door to infection.

But, in addition to cauterization, it is useful and necessary to employ conjunctival irrigations, and there is need for an adjunct to nitrate of silver, which we have probably found in formol.

Besides cauterization with the nitrate, instillations and irrigations, performed with or without an irrigator, will be found of advantage.

Formol is sufficient to cure ophthalmia of the new-born; nitrate of silver also gives excellent results. By combining these two we are sure of obtaining a satisfactory success.

In all cases where patients cannot be treated by practised hands, it is far better to have recourse to formol alone, which can lead to no accident, than to allow applications to the conjunctiva of solutions of nitrate of silver, because of the danger of destruction of the corneal epithelium.

Treatment of purulent ophthalmia with formol has also been tried in the service of Dr. Lagrange at the Hôpital des Enfants, and the results published by Dr. Oliver (Bordeaux, 1894) confirm the results obtained by Professor Badal.

As at the present time an auxiliary, if not a successor, to nitrate of silver is being sought,

therefore the writer has thought well to publish these results, which are brilliant enough to encourage perseverance in this treatment.

For every microbial affection two aims must be realized: the destruction of the infectious agent and the defertilization of the media where it lives, to prevent those which have escaped the action of the microbicide from living and from multiplying.

Nitrate of silver is the best microbicide; formol, as the work of Valude and Dubief shows (*Annales d'Oculistique*, July, 1893), is a most excellent defertilizer; it is therefore the proper agent to complete the therapeutic work.

The combination of these two agents can produce only the best results.

ACUTE POISONING BY ARSENIC, WITH SUBSEQUENT MULTIPLE NEURITIS.

MEIROWITZ reports in the *Journal of Nervous and Mental Diseases* for March, 1895, this interesting case:

J. W., nineteen years of age, though a steel-engraver by occupation, was in the habit of amusing himself by the practice of taxidermy. The shop in which he was employed was infested with rats, and he suggested to his employer that he had a remedy at home that would put an end to the rodent pest. He referred to a quantity of powdered white arsenic (more properly speaking arsenous acid) which he had recently purchased, and which he used as a preservative. He was also in the habit of taking "bromo-seltzer" for headache. He filled an empty "bromo-seltzer" bottle with arsenic for the purpose of taking it to the shop. On the way to his place of business he purchased a fresh bottle of the anti-cephalalgic. Upon reaching the factory he thoughtlessly gave his employer the recently purchased bottle, and retained that which contained the arsenic. In the course of the morning a slight headache caused him to think of his favorite remedy. He poured out a teaspoonful of arsenic (about seventy grammes by weight), and attempted to dissolve it in a goblet of water. He observed that it did not dissolve or effervesce, and thought it rather remarkable. Nevertheless, he gulped down the contents of the goblet, and immediately perceived the mistake he had made. He forced himself to vomit by thrusting the finger into the pharynx, but the vomiting was not very copious. He then went home and laid down. Three hours after the ingestion of the arsenic severe pains came on in the stomach; he began to vomit, and continued to do so for three days at intervals of five to ten minutes; nausea was present between the attacks of vomiting; food could not be taken, and he developed an intense, burning thirst. A physician was called, who prescribed iron as an antidote, but this could not be retained in the stomach. The thirst was so intensely maddening that he attempted to leave the bed to relieve it, but he was so weak that he fell over in a faint. The pain in the stomach lasted for six days; it was somewhat relieved by morphine injections and the application of hot poultices to the epigastrium. The pulse was very weak. The urine was bloody and its passage caused considerable pain. The bowels, at first loose, remained costive for four days. On the second day after the poisoning the patient's eyesight became affected. He could see only in the recumbent posture. Attempts to sit up would result in attacks of syncope. The disposition to syncopal attacks lasted about a day and a half, and was doubtless due to the weak heart action. Then deafness came on and lasted about three days. There were continual tinnitus aurium and hemorrhages from the ears, followed by the discharge of pus. The ringing in the ears persisted for six weeks, then ceased, first in one ear and four days later in the other. On the fourth night after the poisoning the patient became delirious and developed hallucinations of sight. This lasted but a couple of days. The tongue was blistered and swollen, the lips, eyes, and rest of the face were œdematous. Excepting a few "white pimples" on the face, as the patient describes them, there was no skin eruption. He had severe burning headaches, which were not relieved by ice applications. On the seventh night he entered into a condition of collapse, but rallied the next morning. On the ninth day the pain in the stomach ceased and the patient could tolerate a little food. On the eleventh day he was able to leave his bed and walk about. He had lost twenty pounds during his confinement. Nine days after leaving the bed (end of third week after the poisoning) severe, continuous, burning pains manifested themselves in the legs, preventing sleep. Three days later the pains appeared in the feet, which became swollen. The pains remained in the feet for nine weeks. He had never had pain in the arms, but some tingling in the hands. Two months after the accident he entered the New York Hospital for treatment, where he remained for eleven days. He says he was able to walk to the hospital, but when he left he had to be taken home in a coach. This inability to walk caused him to resort to crutches, which

he was using when he came to Dr. Hammond's clinic on October 15, 1894. He had never seen double, the facial muscles had never been affected, nor had there ever been any speech disturbance. An examination of the patient showed the following condition: his gait is that of an ataxic; the legs are lifted high, to enable the toes to clear the ground, and are brought down with a stamp. He walks decidedly better with the shoes on than off. The feet droop; they are cyanosed and cold; there is marked tenderness to pressure of the feet, legs, and thighs; involuntary contractions and twitchings are seen in the calf muscles. The muscles of the legs are atrophied. The calves measure ten and a quarter inches in circumference; the thighs at their lower third measure twelve inches and at their upper third fifteen inches. The thigh muscles have preserved their strength. The weakness affects the parts below the knee-joint. With reference to the reflexes, the examination shows absence of the foot, the patellar, and the cremasteric reflexes. The abdominal, epigastric, and gluteal reflexes are present. Control over the contents of bladder and bowel is normal. As regards sensation, tactile anæsthesia of the feet is found extending to a point immediately above the ankle-joint; two inches above this is an area of hyperæsthesia. Both lower extremities show pretty generally hyperæsthesia to pain. On testing with test-tubes containing hot and cold water, the feet are found to be markedly anæsthetic, while the lower half of the legs are hyperæsthetic. There is also marked anæsthesia of the legs to faradism and galvanism. The patient is able to slightly extend the feet, but finds it impossible to flex them. The electrical tests show R. D. for both the faradic and the galvanic currents. In the upper extremities it is the hands that are mainly affected. Owing to the marked atrophy of the interossei, the lumbricalis, the muscles of the thenar and hypothenar eminences, the movements of the fingers are greatly impaired. Flexion and extension of the hands and forearms are good. The atrophied muscles show the reaction of degeneration. Sensation to touch in the hand is considerably diminished, some areas being anæsthetic. The reflexes in the upper extremities are absent.

The muscles of the trunk show no effects of the poison, nor are there are any disturbances referable to the central nervous system.

THE TREATMENT OF PNEUMONIA.

G. IVANOFF (*Bulgarian Meditzina*, No. 4, 1894, p. 20), senior physician to the Lom Hospital, says that he most successfully treats croupous pneumonia by the internal use of camphor with antipyrin.

℞ Camph. pulver., .5 gramme;
Antipyrin, 2 grammes;
Morph. hydrochlor., .02 gramme;
Sacch., q. s. M.
Ft. in pulv. no. iv.
One to be given every one or two hours.

In adynamic cases he simultaneously resorts to hypodermic injections of camphor, in the dose of from .5 to 1 gramme, three or four times a day, for which purpose he employs a fatty solution (.5 camphor to 1 gramme olive oil). The writer reports a series of twenty-two cases treated consecutively by this method at the hospital during the period December 10, 1893, to March 15, 1894. All of them were rather severe, but nevertheless every one ended in recovery. The hospital registers for 1889 to December, 1893, show that, previously to the introduction of the treatment, from three to seven patients succumbed to the disease every year, the yearly number of pneumonia cases admitted oscillating between twenty and thirty.—*British Medical Journal*, March 2, 1895.

ADMINISTRATION OF SALICYLATES IN ACUTE RHEUMATISM.

LATHAM, in the *Medical Magazine* of March, 1895, gives the following rules necessary to insure success in treating rheumatism:

First.—The true salicylic acid obtained from the vegetable kingdom must alone be employed. If you have to give large doses, avoid giving the artificial product obtained from carbolic acid, however much it may been been dialyzed and purified. An impure acid will very quickly produce symptoms closely resembling delirium tremens.

Second.—Give the acid without any alkali or base. A very good form is to mix one hundred grains with fifteen of acacia powder and a little mucilage. Allow the mass to stand and harden, and then divide into thirty pills.

Third.—Place the patient fully under the influence of the drug,—that is, let him have sufficient to produce cerebral disturbance, such as buzzing in the ears, or headache, or slight deafness; with the development of these symptoms, the temperature and the pain in the joints will begin to decline. To an adult the writer generally administers three doses of 20 grains (six pills) at intervals of an hour, and, if the head remains unaffected, a fourth dose at the end of another hour, and then repeats the 20 grains

every four hours until the physiological effect of the remedy shows itself. In the majority of cases from eighty to one hundred grains are enough. In severe cases one hundred and forty to one hundred and fifty may be required. Afterwards about eighty grains a day are sufficient; and, as the temperature declines, small quantities will develop their physiological effects, sixty, or even fifty, grains being then sufficient to produce cerebral disturbance. It would, then, appear that, so long as the rheumatic poison is circulating in the system, the physiological effect—that is, the effect it produces in the healthy organism—does not show itself; acting as an antidote, the greater the amount of poison the larger must be the dose of the remedy; but as soon as the formation of the *materies morbi* is stopped, then the excess of the remedy acts as it would in the healthy organism, and its peculiar physiological effects are developed. It is a very striking illustration of the difference between the therapeutic effect of a remedy and its physiological action.

Fourth.—Give the patient from forty to eighty grains daily for ten days after all pain and pyrexia have passed away.

Fifth.—Let the patient's diet consist entirely of milk and farinaceous food for at least a week after the evening temperature has been normal. On the other hand, if the patient have meat or soup, you may look forward with fair probability to a relapse.

Sixth.—Take care to maintain a daily and complete action of the bowels. Calomel is the best purgative, from 2 to 5 grains at night, followed in the morning, if necessary, with a saline draught. This is the most important adjuvant to the action of salicylic acid.

Seventh.—Let the patient be enveloped in a light blanket, and with no more bedclothes than are sufficient to keep him from feeling cold. The object of the treatment now is to cool the patient; not, as in former times, to sweat the poison out of him; and the cooler he is kept the sooner will the temperature be lowered.

The causes of failure with this remedy, so far as the author has been able to judge, are:

1. Insufficient doses at the commencement.

2. The non-administration of purgatives such as calomel.

3. Feeding with substances other than milk, such as beef-tea, broths, etc., especially in the earlier stages.

In cases where the temperature had remained at 100° to 102° F. for several days under the administration of moderately large doses, the remedy seemed ineffectual; but on giving 5 grains of calomel at night, repeating it, if necessary, the following night, and feeding the patient exclusively on milk, the disease has at once declined and run a favorable course. The administration of calomel (followed, if necessary, by purgatives) is the best adjuvant to the use of the salicylates. Here the author is only calling to our aid a plan of treatment which half a century ago was found to be of signal service. Referring to the three modes of treatment—by venesection, by opium, and by purgatives—which were in vogue at the time, Dr. P. M. Latham says, with regard to the last, "As this plan of treatment works prosperously day after day in its immediate effects, so day after day it gives an earnest of the remedial impression it is exercising upon the whole disease. It abates the fever, it softens the pulse, it reduces the swelling, and it lessens the pain. In short, it subdues the vascular system like a bleeding and pacifies the nervous system like an opiate; and often in the course of a week the acute rheumatism is gone. In three days there is often a signal mitigation of all the symptoms; and in a week the writer has often seen patients, who have been carried helpless into the hospital, and shrieking at the least jar or touch or movement of their limbs, risen from their beds and walking about the ward quite free from pain."

Of this plan, often so striking in its operation and often so satisfactory in its results, he speaks later. It is called the purgative plan; yet its purpose is achieved by calomel and purgatives conjointly. The purgatives would not answer the end without the calomel; of that there is no doubt; neither would the calomel answer without the purgatives, unless it produced of itself ample evacuations from the bowels. It is probable, in short, that the remedial efficacy of the plan resides essentially in the calomel; however, not as mercury, but as itself,—calomel. If the specific effect of mercury—salivation—arise, it is not only beside our purpose and against our wish, but it begets a serious hinderance to the use of calomel in sufficient quantity for the end in view. Thus the whole plan is frustrated. Having begun one plan of treatment, we are obliged to take up with another. Time is lost, the case is perplexed, the disease is prolonged, and the patient perhaps injured.

Now, if, in the treatment of acute rheumatism, you were to choose one indication and abide by it, and were to trust one class of remedies and to it only, you would find more cases that admit of a readier cure by the method

now described than by either of the two former. You would find the aggregate of morbid actions and sufferings which constitute the disease more surely reached and counteracted and more quickly abolished by medicines operating upon the abdominal viscera only than by those which influence either the blood-vessels only or the nerves only. You would find in calomel and purgatives a better remedy than either venesection or opium.

THE TREATMENT OF EMPYEMATA.

CANTLEY, in the *Archives of Pediatrics* for March, 1895, points out that an empyema may be reabsorbed, especially if the pneumococcus is the originating cause.

It is, however, bad treatment to leave the case to nature, on account of the risk of rupture internally through the lung or externally through the chest-wall.

Whenever pus is diagnosed in the pleural cavity it should be evacuated.

The objects of treatment are (1) to remove the pus, (2) to prevent reaccumulation, (3) to procure complete re-expansion of the lung, (4) to leave behind no deformity.

Aspiration is at best a temporary and unreliable mode of treatment. A thick fluid blocks the canula. Even in the most formidable cases some fluid is sure to be left behind and will act as a source of irritation. If carried out too rapidly, there is danger of rupture of the lung and consequent pyo-pneumothorax or of œdema of both lungs. It is, however, useful in cases of urgency; in cases of sero-purulent effusions and as a temporary expedient in double effusions. Cases recover completely under this mode of treatment, but the risks are out of proportion to the advantages gained. If used, siphon aspiration is better than the use of the bottle.

Simple incision and drainage is better than resection of a rib or part of a rib. It is very exceptional in children not to be able to drain efficiently through an intercostal space. Recovery does not appear to be more rapid under treatment by resection and the shock is more severe. Certainly in the present series of cases the mortality from resection in children under three is enormous as compared with the mortality among those treated by simple incision.

When the medullary cavity of a rib is laid open there is greater danger of pyæmia.

The risk of hemorrhage is very small under either mode of treatment.

It is unnecessary to explore the cavity and break down adhesions. In some cases it may be distinctly injurious.

The chances of a radical cure are certainly no better under treatment by resection. In the present series four were sent out with a sinus as compared with one of those treated by simple incision.

There is greater liability to imperfect expansion of the lung and contraction of the side in cases treated by aspiration or resection or left to nature than if incision and drainage be adopted.

Resection should be reserved for the rare cases in which the ribs are closely approximated, or as secondary means to insure closure of the sinus. It may be used as an accessory measure if drainage is found insufficient, subsequent to the simple operation.

The tube should not be more than two inches long; it is not necessary to insert a long tube, as the mode of cure is not by granulation from the bottom, but by expansion of the lung, ascent of the diaphragm, and contraction of the side. It should be removed as soon as the discharge becomes scanty and serous, sometimes even as early as the third day; otherwise it acts as a source of irritation, keeping up the discharge, prolonging the illness, and militating against a cure.

TREATMENT OF INFLUENZA.

PLICQUE (*Presse Médicale*, February 6, 1895) adheres to the division of the various forms into thoracic, nervous, gastro-intestinal, and cardiac, but points out that it is not rare for the different forms to be combined together or to follow one another. Treatment should first be prophylactic. When several in one family are attacked, they should be isolated in separate rooms, since when together they appear to infect each other. In common cases without special complications, the patient should keep his bed for two or three days, and keep to his room for eight days; otherwise relapses and nervous complications are liable to arise. The medicines recommended by Plicque are antipyrin (30 to 60 grains), tincture of aconite (10 to 30 drops per diem), quinine, and coffee. Antiseptic treatment to the nose, mouth, and pharynx is important,—boracic-acid gargle, boracic vaseline to the nasal cavities, and great care of the mouth. This treatment does much to avoid complications and perhaps broncho-pneumonia.

For the spasmodic cough in thoracic complications he recommends—

Tinct. belladonnæ,
Tinct. aconiti,
Tinct. droseræ, of each, ♏xxx;
Tinct. myrrhæ, ʒiiss.
20 to 30 minims per diem.

Congestion of the bases of the lungs may be relieved by dry cupping; blisters should be avoided. In respiratory catarrh, emetics are useful in children and adolescents, and chlorhydrate of ammonia. Nervous complications with excitement and delirium are best treated with bromide of potassium, 30 to 60 grains per diem. For nervous depression he recommends equal parts of tincture of kola and coca. For the cardiac form, Plicque advises dry cupping, sinapisms, subcutaneous injections of caffeine and ether, or of camphorated oil (sterilized olive oil, 2½ drachms; camphor, 30 grains). In the gastro-intestinal form, emetics are good in young subjects at the onset, and saline purgatives; if much diarrhœa, intestinal antiseptics are useful (salol, naphtol, and salicylate of bismuth). During convalescence, high altitudes are better than sea air.—*British Medical Journal*, March 2, 1895.

THE USE OF MERCURIALS IN OPHTHALMIC PRACTICE.

DABNEY, in the *American Practitioner and News* for March 9, 1895, states that the application of mercurials may be divided into, first, the local, and, second, the internal. Locally, mercurials are used both as remedial agents in disease and as antiseptic agents in operations and wounds. Perhaps their curative power depends also on their action as germicides, but this cannot be proved in many cases. Among the most common diseases for which a preparation of mercury is indicated is inflammation at the margin of the lids, the so-called blepharitis marginalis. The application of a salve of yellow oxide of mercury, of a strength of from one to four grains to the drachm of vaseline, is an almost routine treatment. Yet not all forms of the disease are equally benefited. In the writer's experience it is the variety with little pustules, or scabs at the root of the lashes, in which the remedy is most efficient. In such cases, after carefully cleansing the lid, it is well to touch the edge with peroxide of hydrogen before applying the salve. The application should be made morning and night. In the dry, scaly form other remedies, notably the oil of cade, are often most efficient. In all cases we must of course search for the cause of the inflammation in eye-strain from uncorrected errors of refraction or muscular anomaly, nasal disease, or bad hygiene.

In purulent conjunctivitis, whether of the infant or adult, a solution of bichloride of mercury is a valuable addition to the constant cleansing, hot or cold applications, and nitrate of silver upon which we chiefly depend. In the first stage of gonorrhœal ophthalmia very hot solutions of the bichloride, of a strength of 1 to 6000 or 8000, are of great service. In this connection it is well to note the statement made in the recently issued "Hand-Book of Local Therapeutics," that "a 1 to 10,000 hot solution is more active in destroying pus-formation, or for cleansing purposes, than a 1 to 2000 solution used cold." Yet we often find the iced bichloride solution most valuable in the first stage of gonorrhœal ophthalmia. Later, when there is profuse secretion, the bichloride should be used to the conjunctiva either with a fountain syringe, hand syringe, or medicine dropper. Cases of ophthalmia neonatorum which progress very slowly under the frequent cleansing with boracic acid and daily application of nitrate of silver improve very rapidly when a solution of bichloride two or three times daily is added.

In dacryocystitis, whether acute or chronic, syringing the tear-sac and duct with a solution of 1 to 5000 is valuable.

In ulcus serpens or other corneal ulcers with foul base and tendency to spread, hot bichloride solutions laid on the eye one hour in every three, or even for a longer time, are among our best therapeutic resources. Tonics, hygiene, and diet are of great importance.

In phlyctenular conjunctivitis two forms of mercurials are used. In small phlyctenules grouped around the corneal border, and where the cornea itself is involved, the yellow oxide of mercury salve in the strength above mentioned is an excellent local application. It is often best used in conjunction with eserine; especially in the so-called miliary phlyctenules of the conjunctiva excellent results follow the dusting of a little calomel upon them. Swanzy, in his last edition, states that the yellow oxide salve, of strength thirty grains to the ounce, is the best application to this form of the disease, and either calomel or the salve should be used in the multiple variety. The calomel is changed into bichloride, but just how it acts is uncertain. It is not merely mechanical, as inert powders have been substituted for it without effect. We are cautioned against the local use of calomel in the eye when a preparation of iodine is being administered internally: an iodide of mercury is said to be formed. In

torpid corneal ulcers and superficial opacities of the cornea, calomel or the yellow oxide salve is often useful. In trachoma much has been claimed for a strong solution of bichloride,—250 painted over the everted lids. The weaker solutions are certainly of value when there is much secretion and as applications after surgical treatment, as with Knapp's roller forceps.

Certain Continental oculists, especially the French, have recently written much and with great enthusiasm on the subject of subconjunctival injections of mercuric chloride. The writer has had no experience with it.

BULL, in a recent number of the *New York Medical Journal*, after a review of the recent literature and a summary of forty-eight cases in which he has tried this treatment, concludes that the pain and reaction after the injections are generally severe, and that the only cases in which he seemed to obtain benefit were scleritis and acute irido-choroiditis, non-syphilitic; and, finally, that this method of treatment is still on trial and should not be promiscuously employed.

In wounds of the eye or its appendages cold solutions of the bichloride laid frequently or kept constantly on the eye will do much towards lessening the danger of infection and subduing incipient inflammation. A solution of 1 to 4000 is sufficient for the purpose.

In operations on the eyeball the bichloride is of great service, as it is in operations elsewhere. But there are two limitations to its application: first, solutions not stronger than 1 to 3000 or 4000 are likely to irritate the eye; and, second, some opacity of the cornea has been observed to follow the use of bichloride in operations where the eyeball is opened, as in cataract and iridectomy. Most surgeons have a 1 to 4000 solution used on the face and lids, and a weaker solution, say 1 to 8000, in the conjunctival sac, and a solution of boric acid for irrigating the eye during and after operation.

Second, the internal use of bichloride of mercury in ophthalmic practice may be considered, first, in cases where syphilis is certain or probable; and, second, in cases where no evidences of syphilis exist. To quote Noyes: "In doubtful cases we give mixed treatment, as in whist a player in doubt leads trumps." In cases where syphilis is not believed to exist, the indications for mercurials are three: (1) as a cathartic for its derivative and absorbent action, (2) to promote absorption, (3) as a tonic. Perhaps to these should be added its power as a germicide when administered internally.

1. A mercurial purgative is often valuable in the acute stage of gonorrhœal ophthalmia, of iritis, cyclitis, and other inflammations of the eyeball. Here a good dose of calomel is the best form to use.

2. To promote absorption of inflammatory exudate, even non-syphilitic, mercury is often administered. Recent text-books agree as to its value, but differ somewhat as to the mode of using it in these cases. Norris, for instance, recommends, whether syphilitic or not, bringing the case sufficiently under the influence of mercury as to cause slight sponginess of the gums; while Berry maintains that the use of mercury should be continued a considerable time, and that ptyalism, even in slight degree, is an accident to be avoided. In central choroido-retinitis, where a recent exudate in the region of the macula lutea has greatly impaired sight and threatens irreparable injury to vision, the writer uses mercury by inunction, and pushes it until the gums are slightly touched. Of course other agents are often called for, such as leeching and absolute rest in a dark room. It is remarkable how rapid and complete a recovery such cases may make when prompt treatment is instituted. Several in which vision was reduced to mere perception of light, the patients being unable to count fingers close to them, have recovered perfect sight. How far this result is attributable to mercury, and how far to other remedies or to nature, it is impossible to say.

In sympathetic ophthalmia, in cyclitis with extensive exudation into the vitreous, and in iritis where large synechiæ resist atropine, hot applications, and leeching, the somewhat vigorous use of mercury is indicated. In papillitis it is also worthy of trial. In all these cases it is the writer's custom to use the inunction treatment preferably with the Fraser capsules of mercury. If benefit does not follow by the time the gums are slightly touched, it is well to desist from the use of the drug. Tonics are often indicated at the same time.

In the more chronic affections, such as choroiditis disseminata, opacities of the vitreous, choroido-retinitis, sclero-keratitis, mercury is often prescribed, but naturally with far less promise of good. In these cases it is well to give moderate doses of the bichloride combined with small doses of iodide of potassium.

As a tonic, small doses of the bichloride of mercury are probably valuable in long-standing corneal disease; in choroiditis, in recurring phlyctenular ophthalmia, and in other affections associated with depraved nutrition. In many of these diseases we are no doubt dealing with syphilis, either acquired or inherited; but the

point emphasized is that mercury may be of great value, even in non-syphilitic cases.

Finally, a few words as to mercury in syphilitic diseases of the eye. Here, as elsewhere, we are taught to trust to mercury in the early stages and iodide of potassium in the later. The writer usually orders the mixed treatment in all cases, but determines the dose of the drugs respectively somewhat by the stage of the disease. It is well known that a large proportion of cases of iritis, choroiditis, and other affections of the eye, as well as of the optic nerve, are syphilitic.

PICROTOXIN AS AN ANTISUDORIFIC.

SEMMOLA and GIOFFREDI relate (*Rif. Med.*, December 29, 1894) the case of a lady forty-three years old, who had an attack of influenza in December, 1893, with high, persistent fever, headache, and slight cough. During the long convalescence she began to suffer from sweating, which came on after the least exertion, and gradually increased until the sweat poured off her in rivulets. Together with this hyperidrosis she had dull red patches on the skin, which were more or less persistent. There was no noticeable alteration, either subjectively or objectively, in the nervous system. There was a slight systolic murmur at the apex, and some accentuation of the second sound of the heart in the pulmonary area. Atropine, agaricin, camphor, gallic acid, and other antisudorifics were tried, but with no effect. Semmola concluded that the sweating was due to a vaso-motor paralysis due to the action of some influenzal toxin upon the vaso-motor centre in the bulb. The presence of the dull red patches on the skin offered confirmatory evidence of this diagnosis. Since picrotoxin has a stimulating action on the vaso-motor centre, Semmola administered this drug twice a day in doses of ½ milligramme ($\frac{1}{120}$ grain) each. The result was highly satisfactory. The sweats gradually diminished, and in eight days had entirely disappeared.—*British Medical Journal*, March 2, 1895.

SARCOMA CURED BY ARSENIC.

A well-authenticated case of cure of a sarcoma by prolonged use of arsenous acid is reported in the *Semaine Médicale* (1894, p. 214). The patient was a girl of twenty-three years, from whom a sarcoma had twice been extirpated at the head of the left fibula. It was as large as a small apple, and the glands of the groin and axilla on the same side were swollen. The disease recurred, and as the patient declined amputation, Dr. A. Samter superficially curetted the growth, which proved to be a giant-celled sarcoma, and then prescribed arsenous acid, $\frac{1}{25}$ grain, in a pill; of these, he gave up to ten daily. After nine months the inguinal and axillary glands had greatly diminished in size, and the wound, now only one-half of its original dimensions, presented but a few traces of neoplastic growth. The patient no longer felt any pain in the leg, which she could now use without difficulty. After another curetting and the continued use of arsenous acid for two whole years, a complete cure is reported. There were no more swollen glands, and the left knee-joint (which had been generally swollen) presented an absolutely natural aspect, there being only a small bay cavity, studded with granulations, in the head of the fibula. Microscopic examination showed that these granulations contained no trace of sarcomatous tissue. Other cases of considerable improvement with this drug have been reported, so that the report of this cure should, at least, encourage all practitioners to give arsenic a thorough trial in cases of sarcoma where operative treatment is not available.—*Practitioner*, March, 1895.

TREATMENT OF CYANIDE-POISONING.

ANTAL (*Physiol. Studien aus d. Univ. Buda-Pesth*, 1895) observes that although the cyanides are the strongest of poisons, yet the rapid form of death only occurs in a small proportion of cases of poisoning by them. Atropine, recommended by Preyer against the remote effects, has given negative results. Potassic permanganate, used by Kossa, is perhaps the most efficient of chemical antidotes, yet it also is useless when the poison has got into the circulation. The author has investigated the action of cobaltum nitricum oxydulatum in this respect. When cyanides are present in the stomach of an animal, and a solution of this cobalt salt is introduced, a harmless potassic cobalticyanide (K_3CoCy_6) is formed. That the cobalt salt can render absorbed cyanides harmless is due to the rapidity of its absorption and to the small quantity needed to make large quantities of cyanide inert. As regards the physiological action of cobalt salts, little is known at present; the excretion takes place through the kidneys, and the author believes them to have a powerful diuretic effect. The toxicity of the cobalt salts depends entirely on their concentration, as the author demonstrates by his experiments. In one-half- to one-per-cent. solutions they have no definite action on

the functions of the heart, and the red blood-cells are not altered. The author records a series of experiments to show the antidotal properties of the above-named cobalt salt. When rabbits or dogs are given a lethal dose of cyanide, and a one-half- to one-per-cent. solution of the cobalt salt is introduced into the stomach, no poisonous effects are produced. Experiments are also related which show that this solution, subcutaneously injected, will also neutralize the effects of absorbed cyanide. The author concludes that in man, to render inert already absorbed cyanide, a one-half-per-cent. solution of the above-named salt (10 to 30 cubic centimetres) should be injected subcutaneously; at the same time the same solution should be given by the mouth or, if that is impossible, passed into the stomach by means of a tube, to neutralize any cyanide still present there.—*British Medical Journal*, March 16, 1895.

TREATMENT OF ULCERS.

ALFODI has noticed that infectious ulcers, which seem to be rebellious to all kinds of treatment, assume at once a healthy appearance and heal more quickly when bathed with a solution of one per cent. of sulphate of quinine than when washed with a solution of corrosive sublimate or dusted with iodoform. In the case of simple ulcers, the healing action of the sulphate of quinine is still more rapid.—*Practitioner*, March, 1895.

RARE FORM OF ANTIPYRIN RASH.

In *La Presse Médicale* of February 16 a rare eruption caused by antipyrin is recorded. The patient, aged thirty and very fat, was seized with violent, even unbearable, pains in the head while at his doctor's residence, for which 15 grains of antipyrin were given. His urine contained a little sugar (two hundred and twenty-five grains in the twenty-four hours) and traces of albumin. He also presented an old and obstinate psoriasis in the seborrhœic regions (scalp), scrotum, gluteal folds, palms of the hands, umbilicus, etc. Exactly four to five minutes after the ingestion of the remedy he was seized with tinglings over the whole body, then a desire to scratch himself. His face became red, his eyes filled with tears, a keen sensation of heat was experienced, his pulse noted 120 to 130 pulsations, at the same time red patches appeared on his neck, then on his back. On the morrow, after a sleepless night, there was the same febrile state, the same pruritus. The eruption at its height consisted of a collection of plaques of a bright, inflammatory redness, scattered at all points of the body, without special localizations, without marked symmetry. In general round in shape, these plaques were mostly of the size of a five-franc piece. They formed a slight relief, and in their neighborhood the skin was perceptibly hotter. Taken between the finger and thumb, these lesions, in no way painful, gave the sensation of a pretty deep thickening of the skin; their evolution was rapid. On the second day after the febrile state had disappeared the itching diminished progressively, to disappear on the eighth day. Most of the plaques grew pale, became covered with slight scales, and disappeared in fifteen days. Some of the largest ones presented in their centre an epidermic upheaval (abortive bulla), and were a little longer in disappearing. The patient afterwards stated that years before a dose of antipyrin had given him similar trouble. The eruption described differed from a nodose polymorphous erythema in the abruptness of the onset, the tingling and pricking over the whole cutaneous surface, in the itching preceding the eruption, and in the eruptive elements being more numerous, less prominent, painless, and with rapid evolution.—*British Medical Journal*, March 9, 1895.

NEW PHENIC PREPARATIONS.

DR. GALEZOWSKI (*Annales d'Oculistique*, January, 1895) recommends phenate of mercury in diseases of the cornea, especially in herpetic phlyctenular keratitis. This preparation is an advantageous substitute for yellow ointment, which is at times irritating.

As a wash or instillation, the following solution:

> Distilled water, 100 grammes;
> Phenate of mercury, 10 to 47 milligrammes.

As an ointment:

> Lanolin, 10 grammes;
> Phenate of mercury, 5 to 10 centigrammes.

The author recommends the avoidance of cocaine in herpes of the cornea, inasmuch as this is an anæsthetic disease. The above preparations should not be used until steam douches or mydriatics have reduced the congestion; they should, moreover, be discontinued if they are not well borne.

In addition to these external preparations, Dr. Galezowski has also employed phenate of gold internally, in the form of hypodermic in-

jections. This medication seems to produce good effects in optic atrophies. In tabes the atrophy is arrested under their influence.

POISONING BY DRUGS GIVEN BY THE RECTUM.

BINZ (*Berl. Klin. Woch.*, January 21, 1895) speaks of poisoning by drugs administered by the rectum. He refers to cases of poisoning by corrosive sublimate, opium and chloral, morphine, chloral, carbolic acid, and atropine. The sublimate and carbolic acid were both used as vermicides. In all the cases the dose of the agent employed was large. The medico-legal aspect of such cases is obvious. The vagina probably absorbs less readily than the rectum, yet cases of poisoning have also been recorded here. Recently it has been shown that potassic iodide, iodoform, salicylic acid, salol, and antipyrin are absorbed from the vagina, and that during pregnancy, the puerperium, and fever this power of absorption is increased. Agents administered per rectum or per vaginam should, of course, be classed as internal remedies and not as external ones. The same caution is used in injections into the bladder or uterus.—*British Medical Journal*, March 9, 1895.

INSOMNIA IN SURGERY.

VAN SCHAICK, in the *New York Medical Journal* for March 2, 1895, briefly concludes a paper on this subject by stating,—

1. That insomnia, from whatever cause, is an important complication of surgical disorders.

2. Its relief is necessary to the comfort of the patients, improves the prognosis, and materially assists recovery after operations.

3. Where pain is the chief factor, morphine is the only drug that will relieve with certainty.

4. There are many surgical disorders in which insomnia may be relieved by trional; and, finally,—

5. Trional is an excellent drug for the purpose, as it acts rapidly and safely, has no inhibitory action upon the secretions, seems to possess a stimulating effect, is well borne by the stomach, is easily absorbed by the rectum, and fails to produce unpleasant after-effects.

THE FORMATION OF PHENYL SULPHURIC ETHER AND THE TREATMENT OF CARBOLIC-ACID-POISONING.

It has been shown by Baumann that carbolic acid, when absorbed, unites with sulphuric acid in the system and forms phenyl sulphuric ether; also the use of sulphates has been advocated in carbolic-acid-poisoning.

PIO MARFORI, in the *Archives Italiennes de Biologie*, tome xxii., Fasc. II., records the results of a number of experiments made on animals in order to determine (1) the quantity of phenol tolerated by the organism and the amount of phenyl sulphuric ether which can be formed; (2) the quantity tolerated when sulphates are administered simultaneously, and how much phenyl sulphuric ether is then formed. These substances were administered by intravenous injection, and the sulphate used was ammonium sulphate. The author found that the tolerance for carbolic acid increased with the weight of the body of the animal. The quantity of phenyl sulphuric ether formed—estimated by the amount of this substance in the urine—almost always remained much below that which would correspond to the phenol injected. Dogs were able to tolerate large doses of carbolic acid when ammonium sulphate was administered at the same time. The quantity of phenyl sulphuric ether formed when carbolic acid and ammonium sulphate were injected together was greater than when carbolic acid was injected alone. The sulphuric acid of the sulphate injected serves in part for the formation of phenyl sulphuric ether. A large portion of the phenol, however, does not combine with the sulphuric acid. There exists, then, a limit in the capacity of the organism for the formation of phenyl sulphuric ether. As the tolerance for carbolic acid is increased by the presence of sulphates in the organism, the latter ought to be used as antidotes in cases of carbolic-acid-poisoning, though their action is very limited.—*British Medical Journal*, March 9, 1895.

A CHEMICAL ANTIDOTE FOR CHLORAL-POISONING.

The *Glasgow Medical Journal* for February publishes an article on this subject by DR. JOHN DOUGALL, of Glasgow. When chloral was first used, says the author, its hypnotic action was thought to be solely due to the generation of chloroform from it by the alkalies of the blood; its effects on the body generally were, and indeed still are, held as almost identical with those produced by chloroform. This view, however, he says, has been disputed on the grounds that the quantity of chloroform which a full dose of chloral is capable of producing is quite inadequate to cause the hypnosis and anæsthesia that have been observed; also that the greater part of the chloral is exhaled from

the lungs unchanged, and that small quantities of it may be found in the urine, but no chloroform. Whatever facts or theories, however, says Dr. Dougall, there may be regarding the manner of the hypnotic and anæsthetic action of chloral, there can be no doubt about its chemical composition and affinities, and, in particular, that it is almost at once decomposed, at and above 60° F., outside of the body in an alcoholic solution of potassium into formate of potassium and chloroform, and, as the author has proved by trial, somewhat less quickly in an aqueous solution of potassium.

Assuming, he says, that a person has taken a poisonous dose of chloral, say 80 grains, and that there could with safety be given, as a chemical antidote, 27 grains of potassium, this amount being the quantity by weight in the formula required to decompose 80 grains of chloral; in such a case, says the author, there are strong *a priori* grounds for assuming that in about fifteen minutes the chloral in the system would be entirely changed into formate of potassium and chloroform, or, at least, that so much of it would be decomposed that the residue would be harmless. But would not the potassium, he asks, or the amount of its formate, or of the chloroform thus produced, be as lethal as the chloral? Undoubtedly, 27 grains of potassium swallowed at once, even much diluted, would cause serious symptoms. But if even half that quantity were given in divided doses—say 7 grains every hour—in warm milk, gruel, or barley-water, it seems very probable that by this means no serious irritation of the gastro-intestinal tract would be produced, and that in a short time so much of the chloral would be decomposed as to render the rest at least non-lethal.

The liquor potassæ of the British Pharmacopœia, says Dr. Dougall, contains about 1 grain of potassium in 16 minims, and the maximum dose stated is 60 minims; hence, he says, to give 7 grains of potassium is equal to giving 112 minims of liquor potassæ. He thinks it may be assumed that this quantity, highly diluted, might be given without fear of causing unfavorable symptoms. By this means 20 grains of the chloral would soon be decomposed, thereby neutralizing its lethal power to a certain degree, if the potassium is given before the patient is too far gone to be afforded relief by this means; then, if in an hour after a similar dose of potassium is given in the same way, this would reduce the chloral in the system to forty grains, a quantity quite within the bounds of safety for an adult, provided there is no heart-trouble.

Dr. Dougall says that he has proved by experiment what has been stated by others,—namely, that the carbonates and bicarbonates of potassium and of sodium also decompose chloral; but their action, particularly that of the bicarbonates, is very slow, and, besides, a much larger quantity than of potassium is required, also a heat much above that of the body. With regard to the action of formate of potassium, it merely causes a peculiar eruption of the skin, which soon disappears when the use of the drug is stopped. This eruption is well known to habitual chloral takers, and seems to prove that chloral is decomposed in the blood as stated.

With regard to the probable effects of the chloroform which would be generated by the decomposition of 40 grains of chloral, the author finds that this quantity of chloral requires 13.5 grains of potassium for its decomposition, which results in the production of 28.5 grains of chloroform, equal to 21.5 minims. As much larger amounts of chloroform (from half an ounce to four ounces) have been swallowed and recovery has followed, and as it is likely that the greater part of that which is generated in the blood by the decomposition of the chloral is exhaled as fast as it is produced, Dr. Dougall thinks that nothing serious need be feared on this point.—*New York Medical Journal*, March 2, 1895.

CARBOLIC ACID GANGRENE.

LANNAY (*Annales de Méd.*, March 1, 1895) states that a considerable number of cases have already been recorded in which carbolic dressings have caused gangrene. He relates the following case to show that this may result, as he believes, even when a weak solution of carbolic acid is used. The patient is a man aged fifty, who, during the war in 1871, suffered from a frost-bite of the right foot. From this, however, he recovered without losing any of his toes. In 1894, after exposure to cold, the same phenomena as in 1871 showed themselves, but after three months the patient was again cured. In December of the same year, after exposure, the toes affected again became bluish, and, the pain being worse in the following month, a doctor recommended a carbolic foot-bath. Three baths of three-quarters of an hour were taken each day, a solution of about three per cent. being used. In the interval between the baths the patient kept a wet dressing of the same solution wrapped round the fourth toe, the one most affected. After three or four days of this treatment the fourth toe began to

show signs of dry gangrene, but the patient persisted for some days in continuing the treatment, without consulting his doctor again. He was then found to have a dry gangrene of the whole of the right fourth toe, which Lannay considers to have been determined by the carbolic acid. He points out that the solution used was made without any alcohol or glycerin, that under these circumstances the carbolic acid may not be completely dissolved, and undissolved crystals may come into direct contact with the skin.—*British Medical Journal*, March 23, 1895.

THE TREATMENT OF FROST-BITES.

The *Lyon Médical* for January 27 publishes the following suggestions from M. BESNIER and M. BROCQ: For frost-bitten hands, bathe the hands in a decoction of walnut leaves; dry them and rub them with strong tincture of camphor; then dust them with the following powder: bismuth salicylate, 150 grains; starch, 2½ ounces. For allaying the itching at night, a mixture of 1½ grains each of rose-water and tannin and 1¼ ounces of glycerin should be rubbed on the hands, and this is to be followed by the use of the powder.

If the hands are ulcerated, they should be wrapped in walnut leaves softened in hot water.

Another remedy the efficacy of which has often been witnessed is 3 ounces of fir balsam and 15 drops of hydrochloric acid. This should be applied to the affected parts twice a day.—*New York Medical Journal*, March 2, 1895.

PHENOCOLL IN PREGNANT WOMEN.

M. TITONE, of Palermo (*Rif. Med.*, November 24, 1894), in view of the well-known ecbolic action of quinine, was led to try phenocoll in pregnant women suffering from malaria. The results were such as to satisfy him that while the drug is efficient as a remedy for malaria, it has no action on the uterus. He gave it in doses of 1½ grammes, divided in four cachets, to be taken according to the Roman method,—that is to say, five, four, three, and two hours before a febrile paroxysm is due. The drug was given in this way till the attacks ceased, and in all the cases pregnancy went on to term without any of the uterine contractions, fœtal movements, or slight hemorrhages due to partial detachment of the placenta, such as are observed when quinine is administered to pregnant women. The author gives details of four illustrative cases, but he has used the drug in many more with equally beneficial results.—*British Medical Journal*, March 23, 1895.

THE BLOOD ALTERATIONS OF ETHER ANÆSTHESIA.

J. CHALMERS DA COSTA contributes a most interesting paper to the *Medical News* of March 2, 1895, upon this topic. He concludes that,—

1. Etherization produces a marked diminution in the hæmoglobin of the blood.

2. The red corpuscles and the hæmoglobin are especially affected in blood previously diseased,—in such conditions, for instance, as anæmia.

3. Irregular reports are due to faulty observation, to the presence of altered hæmoglobin in the blood, to the faulty aberration as to color of a Fleischl instrument, or to taking the blood before anæsthesia is completed.

4. The white corpuscles show irregular changes which are not characteristic, and exhibit variations not more pronounced than would be found in the same number of samples of normal blood on different examinations.

5. Age does not apparently influence the results.

6. Ether pneumonia may possibly be due, in some instances at least, to the action of intense cold upon the lungs, produced by the action of ether vapor.

7. Œdema of the lungs may arise from contraction of the pulmonary capillaries, thus producing a loss of *vis a tergo* and damming up of blood in the veins. Furthermore, the same condition may produce sudden paralysis of the heart.

8. The often-quoted observation as to the effect upon the hæmoglobin of shock and hemorrhage requires enlarged repetition upon human beings before the statements can be unreservedly accepted that hemorrhage causes a great fall in the amount of hæmoglobin, but that shock does not affect it.

9. The chilling of the blood-stream may be responsible for the nephritis that occasionally follows etherization.

10. Prolonged anæsthesia profoundly deteriorates the blood and strongly militates against recovery; hence rapidity of operation is most desirable.

TREATMENT OF URIC ACID GRAVEL.

HENLEY writes in the *British Medical Journal* for March 23, 1895, that the treatment of uric

acid gravel takes two directions, according as we desire to increase the solubility or decrease the amount of uric acid formed. It is well to remember that in the majority of cases uric acid deposits are due to an increased tendency to precipitation and not to excessive formation of uric acid.

In cases due to an increased tendency to precipitation we have to give drugs which help to hold uric acid in solution. In spite of the recent outcry against piperazin, the writer has found it of great service, particularly in all cases in which gravel has been due to diminished solvents and not excessive formation of uric acid. In fact, it appears to have no action whatsoever on the quantity of uric acid daily formed in the organism, but merely on its solubility. On this account he gives it in such cases in combination with alkalies, either in the shape of alkaline waters or potassium bicarbonate combined with iodides. It is as well to remember that as the urine is naturally most acid at night and early morning, and therefore most likely to deposit uric acid, we can get over this by following Sir William Roberts's advice and give the alkalines at bedtime. The diet in these cases is not of so much importance, except in favor of salines and vegetables.

In cases, again, when the uric acid deposit is due to excessive formation, a carbohydrate diet is the most useful. Starch, sugar, and vegetables should, therefore, be the staple diet, and meat and fish only in small amounts. The old idea that sugar causes an increase of uric acid has no foundation, as the writer found in a series of experiments performed on himself, when he took as much as a quarter, or even a pound, of sugar a day without causing any noticeable increase in the uric acid passed. Alcohol, on the other hand, should be prohibited, as it causes an increase in the quantity of uric acid voided.

Quinine and arsenic decrease the quantity of uric acid, because they diminish the quantity of leucocytes, and therefore, in cases where gravel is due to an excessive formation of uric acid, they are most valuable. While moderate muscular exercise is of service, excessive exercise is, on the other hand, harmful.

In cases of excessive formation, although alkalies are of some assistance, they, like piperazin, are only of secondary importance by increasing the solubility of the uric acid formed.

The subject of treatment could well be gone into much more fully, but we have said sufficient to indicate the general principles on which it should be conducted.

ON TAPPING THE PERICARDIAL SAC.

In December, 1891, a girl of eleven was seen in a second attack of acute rheumatism, the first attack having taken place some years previously, when she was under the care of another practitioner. After the first few days following the onset of the symptoms of rheumatism, the breathing became rapid and labored, and on examination of the præcordial region a to-and-fro murmur was heard over the whole area. Dulness extended from the upper border of the second rib on the same side down to the upper border of the fifth rib on the same side as the child lay on her back. Sodium salicylate was given in 10-grain doses every four hours for three or four days. The joint pains were relieved, but the effusion into the pericardial sac increased rather than decreased, and the breathing went up to 60 in the minute.

In consultation it was agreed to tap the pericardium; but to confirm the diagnosis, the writer inserted a hypodermic syringe of 20 minims' capacity between the third and fourth ribs on the left side, and, close to the sternum, withdrew a syringeful of serous fluid. In a few minutes the patient breathed more freely and with less frequency, illustrating a point that has been emphasized by Professor Sir Thomas Grainger Stewart,—namely, that the withdrawal of even a small quantity of fluid from the vicinity of a vital organ makes a profound impression upon that organ. Hoping to get further benefit, the author advised and thought fit to remove a larger amount of fluid by means of the aspirator. He thrust in the needle near the original spot some five hours after the first operation, and withdrew two and a quarter fluidounces of a serous fluid tinged with blood.

He selected the space between the third and fourth ribs because it appeared to be the spot where the dulness was most marked.

Immediately after this second operation the breathing became more labored and the child appeared to be distressed to an alarming degree. However, in the course of half an hour she calmed down and became comparatively comfortable; but this was only of short duration, for in the course of an hour or more the breathing again became labored and more frequent, and the patient gradually sank, death taking place twelve hours after the second aspiration.

The writer would not again tap the pericardium in a case of effusion attendant on rheumatism, for he believes such cases are best left alone. He then relates in confirmation of this belief the following case:

A woman, aged thirty, had repeated attacks of acute and subacute rheumatism, and in connection with the one related she had considerable effusion into the pericardial sac. The breathing was much affected, and to one inclined to aspirate there was every indication for performing the operation. Instead of doing this, the salicylate of sodium was given in medium doses, and a large amount of liquid nourishment was administered at frequent intervals. The result was that the woman got well in the course of a few weeks.—*British Medical Journal.*

IN WHAT WAY DO DIET AND DRUGS WHICH CLEAR THE BLOOD OF URIC ACID AFFECT THE ARTHRITIS IT PRODUCES?

HAIG writes as follows in the *British Medical Journal* for March 23, 1895:

It appears to have been concluded by some of those who have read the writer's previous papers that drugs which clear the blood of uric acid, and may under certain circumstances produce arthritis in doing so, must of necessity produce arthritis under all circumstances whenever administered. So he has been asked to explain how it is that iodides and other drugs which he has shown clear the blood of uric acid are nevertheless useful in uric acid arthritis.

A similar question has also been recently raised in the *Medical Record*, January 26, 1895, p. 113, with regard to the effects of meat diet in arthritis, in connection with Haig's paper on the direct introduction of uric acid, in the *British Medical Journal* of December, 1894; and it is there evidently concluded that, as meat diet introduces a lot of uric acid into the body, it must of necessity produce arthritis, and cannot possibly cure or prevent it.

A very brief consideration of the actual causation of arthritis by uric acid will suffice to show that these difficulties and apparent contradictions are without any foundation in fact.

He has often produced arthritis in himself, working under conditions where, all the factors being recorded day after day, he could see every move in the process; he has unintentionally done the same in others, and has seen it done very often indeed by others. The patient is, of course, said to have had a relapse; but look at the list of drugs used, and note their effects on the solubility and excretion of uric acid, and you will often have no difficulty in saying why the relapse occurred.

From such experience, if he is going to produce an arthritis,—and he has complete confidence that he can do so at pleasure,—he brings about two things: (1) a considerable excess of uric acid in the blood, in solution probably with some salt of potassium or sodium; (2) the sudden supervention on 1 of some condition unfavorable to the solubility of uric acid in the blood, so as to precipitate it on the joints. Unless 2 duly supervenes on 1, no arthritis results, and either excess of uric acid in the blood or its absence from the blood may occur alone without any arthritis.

Now, as to mineral waters containing sulphates, it is well known that their first effect is often to precipitate an attack of gout,—that is to say, the patient comes to the spa with 1 and the water taken produces 2, and the result is a more or less severe attack of arthritis, according to the amount of uric acid present and the rapidity with which it is driven into the joints. But when this attack has passed over, absence of urates from the blood continues, the sulphate water being continued, and there is no further arthritis, as 1 is now absent and the gout is said to be cured. With 2, and as its result, there is a general stimulation of nutrition and metabolism throughout the body, and the blood is kept clear of urates for a considerable time, perhaps till the following spring or summer; but then, if not sooner, a repetition of the water is required, and the same sequence of events is repeated.

A considerable number of drugs owe their reputation for the cure of gout and rheumatism to their power of keeping the blood clear of uric acid. It follows from what the writer has just said about drugs, and previously said about diet, and is quoted as saying in the *Medical Record*, January 26, 1895, p. 113, that meat diet, if it be well taken, well digested, and if the patient be young enough to have his nutrition stimulated by it, will produce absence of urates from the blood, and so long as it continues to do so there will be no arthritis. An excess of uric acid is being introduced, but it does not remain in the blood, because the conditions are unfavorable to its solubility; hence meat diet may prevent rather than produce arthritis.

Unfortunately, however, some patients are too old, others are already too feeble and wasted, to respond to any stimulus, and others may at first respond to the stimulus of meat diet, and later, from old age or other causes, fail to do so, and then their blood will become a good solvent of uric acid, and all the urate they have previously been introducing in meat

diet, or retaining with drugs or mineral waters, will come through their blood and produce all the worst effects of severe uricacidæmia. For this reason the prevention of the production of 1 by diminishing the intake and formation of uric acid is decidedly the better of the two, and it is by no means as difficult to accomplish as some would have us believe.

It is believed, therefore, that drugs which clear the blood of uric acid may, if there is much of it in circulation when they begin to act, produce an arthritis; but if there is but little in circulation, the signs of arthritis may be so slight as to escape notice. After the first arthritis is over, and so long as they keep the blood clear of uric acid, they will prevent rather than produce arthritis. Meat diet, or uric acid itself regularly administered, acts in the same way and may produce the same results.

EXCISION OF THE RECTUM FOR MALIGNANT DISEASE, DESCRIBING A METHOD OF OPERATION.

HEUSTON (*British Medical Journal*, May 25, 1895) gives in detail two cases in which the above operation was successfully performed. The author states that the operative treatment of malignant disease of the rectum has been for many years a subject of interest to surgeons, and of the different methods recommended for dealing with such cases none has had more vicissitudes than that of excision of the diseased portion of bowel and implicated structures surrounding it. Since the introduction of this operation by Faget in 1763 there have been periods when it held an acknowledged position, as there have also been periods when it was considered inadmissible. The reasons for the disrepute into which this operation fell for so many years is evidently due to its adoption in improper cases. It is, however, true that, with our advance in surgery and a more accurate knowledge of the special circumstances which indicate the different methods of operation, its value will be more generally recognized.

In the first case operated on by the writer, the patient, aged fifty-nine, gave the following history. For a lengthened period, although his bowels were relieved normally in the morning, he had a great desire to go again about 10 P.M., when he passed a small quantity of mucus. Some seven months since he noticed blood on the stools, and a little blood also appeared with the mucus when he went in the evening. From this time he had great desire at intervals, it being frequently necessary to relieve the bowels seven or eight times during the night, blood and mucus passing on each occasion, with a feeling of soreness near the anus. For the month previous to coming under Heuston's care he had pain and difficulty during micturition, it being necessary to stand and force for some time before urination. Examination showed a hard, irregular growth implicating the anterior aspect of the bowel, extending from slightly above the upper border of the internal sphincter for about three inches upward on the anterior and lateral walls of the bowel, but not implicating its posterior wall.

Operation being agreed to, the patient was retained in the lithotomy position by Clover's crutch, and an incision was made in the median line from the anus to the tip of the coccyx. The bowel was now separated in its entire circumference by scissors, keeping below the diseased structures and above the attachments to the bowel of the levator ani and the sphincter muscles, when the bowel came down without trouble, except on its anterior aspect, where it was intimately attached to the prostate gland, from which the author separated it by careful dissection with a blunt knife and scissors, when there was no difficulty in drawing the bowel down and removing the diseased portion. There was little hemorrhage, as clip forceps were applied to each portion of the bowel before it was removed. Catgut sutures were now passed through the bowel, about an inch above its cut extremity, including all its thickness, with the exception of the mucous coat, and then through the pelvic fascia and levator ani muscle; this closed off the superior pelvic space and fixed the bowel in its position, thus hindering undue dragging on the second line of sutures which were applied, and which connected the cut extremity to the attachment of the levator ani, the sphincter muscles and mucous membrane which was left below when originally separating the bowel. A drainage-tube was now placed into the space behind the bowel, and the incision from the anus to the coccyx closed. After the operation the patient progressed satisfactorily, the bowels being kept from moving by opium until the seventh day, when, the temperature showing an upward tendency, a dose of castor oil was given, after which recovery was uninterrupted, the patient being allowed out of bed two weeks after operation, and sent home a week later, with full control over his bowel. Microscopic examination showed the tumor to be cylindrical epithelioma. It is now three years and six months since operation.

The second patient, a woman, aged fifty-one years, was first seen in 1891. She complained

of pain in her back, from which she had suffered for some years; this had become very severe for the past two weeks, even when lying down, although aggravated by standing or sitting. Constipation was present, and seven months previously she noticed a swelling at the anus and pain on going to stool, which was much worse when the bowels were confined; blood was also present. Examination revealed internal piles, one of which was ulcerated. Under treatment she rapidly recovered.

This patient next consulted the writer in 1892, when she stated that she had had a severe attack of influenza in January, after which she was greatly debilitated, and had a severe pain in her back, with a gradually increasing difficulty in obtaining movement of the bowels. Examination revealed a well-marked growth, implicating the posterior wall of the bowel, between two and three inches from the anus; this growth lay between the rectum and the sacrum, on which it could be slightly moved. The mucous membrane over the tumor was ulcerated to about the size of a crown piece.

Operation was performed as in Case I. When the tumor was reached it was found attached to the sacrum by cellular tissue, which was easily separated; the diseased portion being removed, the bowel was drawn down and deep sutures applied, as in the former case. When the second row of sutures uniting the extremities of the bowel were applied, a considerable cavity remained between the bowel and sacrum; a drainage-tube was passed into this, and the wound from the anus to the coccyx sutured, the tube being allowed exit at the posterior extremity of this incision. For some days after operation the patient was very restless. The stitch nearest the anus tore through, and a large quantity of serous discharge came through the drainage-tube. A purgative was given on the eighth day. She was allowed out of bed on the seventeenth day, and went home on the thirty-first day after the operation, having all but perfect control over her bowel, the only subsequent trouble being a slight mucous discharge from the bowel at its posterior aspect, where the sutures tore through. Two years and nine months have passed since the operation.

He then directs attention to certain points in connection with the operation. In these cases it is of importance that the peritoneal cavity be not opened; this may be usually attained by remembering that the peritoneum usually covers the anterior aspect of the rectum in the male to within three inches of the internal sphincter, while in the female we cannot be sure of more than two inches, although there may be much more in either case. At the posterior aspect of the bowel you can count on four or five inches. As a practical rule, he considers that if the surgeon can, by digital examination, reach above the malignant growth, the peritoneum should be safe.

The great objection to excision of the rectum by the usual operation is the incontinence, owing to the removal of the sphincters, and the importance of overcoming this sequela is apparent; and to point out how this may be attained, he describes the usual operation, and compares it with the method employed in the foregoing cases.

The usual operation was commenced by an incision from the rectum to the coccyx; then incisions were made around the anus, meeting in front, the attachment of the levator ani to the rectum was cut, and the bowel with sphincters drawn down; thus the most of the external sphincter and all of the internal sphincter were removed, and incontinence, which was often permanent, resulted. Further, the remains of the bowel not being usually united to the skin, owing to the frequency with which the sutures tore through, the raw surface thus left to granulate was a frequent source of septic infection and subsequent stricture.

The operation the writer employs is commenced by an incision from the rectum to the coccyx, as in the former operation; this, being in the median line, severs the attachment of the external sphincter and levator ani muscles to the ano-coccygeal ligament; the rectum is now separated from the surrounding cellular tissue, and clip forceps applied to the rectum at the commencement of the ampulla, below which the bowel is divided; the attachments of the levator ani and sphincter muscles to the bowel are thus not interfered with, and hemorrhage is restrained. The rectum being now completely divided above the internal sphincter, there is not much difficulty in drawing it downward and backward through the median incision, its separation from the prostate and base of bladder being facilitated by having to draw it backward. Clip forceps are now applied above the diseased portion, which is removed by scissors. The upper portion of the bowel is now fixed by deep sutures attaching it, about an inch above its cut extremity, to the recto-vesical fascia and levator ani muscle, thus closing the space between the levator ani and the peritoneum. In applying these sutures, care should be taken that the mucous coat of the bowel is not penetrated. A second row of sutures is now applied between the cut ex-

tremity of the bowel and that portion which had been originally left below; these sutures should penetrate the entire thickness of the bowel in both instances. The object of the upper row of sutures is to fix the bowel so as to obviate the danger of the sutures uniting the cut extremities of the bowel tearing through. The incision from the anus to the coccyx is now closed, the most anterior suture including the posterior aspect of the bowel, but not penetrating the mucous coat. The levator ani and sphincters will thus have their normal relation to the extremity of the bowel preserved. It might be thought that the lower portion of the bowel is in danger of sloughing, owing to the superior and middle hemorrhoidal arteries being cut away from it, but the hemorrhoidal branches of the pudic arteries are sufficient to maintain its vitality.

Should the peritoneal cavity be opened, it is very effectually closed by the deep row of sutures. The advantages claimed for the operation are: it preserves the normal functions of the bowel, subsequent stricture is not so liable as after the usual perineal operation, convalescence is rapid, the mortality is low, and the disease is no more liable to recur than after the more extensive operations.

A LACHRYMAL DOUCHE.

For purposes of cleanliness and medicating the tear-passages, DR. THORINGTON strongly recommends, in place of the Anel's syringe, an easily improvised lachrymal douche. To one end of a piece of small rubber tubing four or six feet in length is secured a right-angled glass tube, which is inserted into a bottle containing a weak solution of boric acid or other medicated fluid; to the other end of the tubing is attached the nozzle of the syringe. The douche thus constructed is more easily adjusted than the syringe, and at the same time an even and regulated amount of pressure can be given by raising or lowering the bottle of fluid as the individual case may require, the patient, if necessary, assisting the physician in this procedure; otherwise the bottle containing the fluid may stand on a shelf near at hand or above the patient's head. As the Anel's syringe cannot be steadied either at the time of introducing the nozzle or during its use, the point of the nozzle, on this account, not infrequently irritates or wounds the delicate membrane lining the lachrymal canal, which is not the case in using the douche. Furthermore, it is not necessary to introduce the nozzle more than once at one sitting, whereas with the syringe several introductions have to be made. —*Polyclinic*, June 1, 1895.

THE VALUE OF THE SERUM TREATMENT IN TETANUS.

IN an extremely timely and interesting article on this topic, Kanthack (*Medical Chronicle*, May, 1895) reviews the whole subject from a clinical stand-point. He points out that the severity of tetanus and the seriousness of its prognosis depend, among other things, upon the rapidity of the onset, the acuteness of the case, and the period of incubation,—*i.e.*, the shorter the incubation the more serious the outlook. Richter states that in cases of an incubation of one to ten days, over ninety-five per cent. die, and of seven hundred and seventeen cases, eighty per cent. died. He justly states that in estimating the value of the antitoxin treatment, we must consider closely several different points of which the following are most important:

The nature and the seat of the injury: Tetanus following an injury to the head is said to be more serious, and such cases are supposed to run an acute course.

The condition of the wound: It seems that suppurating wounds are followed by severer spasms than slight, superficial, or clean, rapidly healing wounds.

The duration of the incubation period: That has already been alluded to.

The rapidity of the onset: The more rapidly the spasms become general the graver the outlook.

The age and general condition of the individual affected: Tetanus neonatorum and puerperal tetanus are always severe.

The promptness with which any kind of rational or radical treatment can be and has been applied.

In examining the results so far obtained in the so-called antitoxin treatment, the author, to begin with, enumerates all the cases so far as he has been able to collect them from all the journals and from private inquiry, and without critically analyzing them. From this table he learns that thirty-one cases have been treated with Tizzoni's antitoxin up to February, 1895. Of these, twenty-three recovered, or we have a mortality of 25.8 per cent. Seven have been treated with Behring's serum, and of these, five recovered,—*i.e.*, we have a mortality of 28.57 per cent. Thirteen cases have been treated with Roux's serum, with four recoveries,—*i.e.*, a mortality of 69.2 per cent. Three cases have been treated with antitoxin from sources other than mentioned above, and of

these, two recovered,—*i.e.*, we have a mortality of 33.3 per cent.

According to the table, Tizzoni's antitoxin comes out best, the mortality being only 25.8 per cent. But we must remember that (1) we are considering only the published cases; (2) all the cases have been put down without the slightest attempt at a critical analysis; (3) it appears from words used by Albertoni and Rotter that the Italians have refrained from publishing some of their fatal cases. Adding up all the cases treated by the serum or antitoxin method, we find that, disregarding suppressed fatal cases, of fifty-four cases, twenty died,—*i.e.*, a mortality of thirty-seven per cent.; therefore we obtain figures which more or less agree with Sormanni's statistics.

But, on applying a little criticism, the following facts seem clear. Of the cases treated with Behring's fluid, one must be excluded, since here a very small quantity was administered to an already dying infant. It is also true that one of the cases treated with Roux's serum should not be considered, because the tetanic symptoms ceased after the amputation of the injured finger, and a very small quantity of the serum was injected. Again, all the cases which died in a single day's treatment should be excluded; these were eleven in all. Finally, all successful cases should be disregarded where the antitoxin treatment was not begun until ten or fifteen days after the appearance of the disease, for it is evident that such cases have a spontaneous tendency to recovery, and hence when the serum therapy is applied it proves nothing. Taking out these cases, it leaves, in all, thirty-three, with a mortality of twenty-five per cent. This result would be extremely satisfactory if it were entirely trustworthy and beyond further criticism.

In summing up, it seems that the serum treatment has not actually changed the prognosis in acute and serious cases. In the milder cases it seems to lessen the spasms, the pain, and the distress, and, fortunately, it has reduced the mortality, but to what extent cannot be told until we are in possession of a larger number of cases and until we are certain that all cases are published. It is quite certain that the antitoxin is still on its trial, and that no really acute or otherwise hopeless case has yet been cured. It is the duty of the physician to use the antitoxin in all but hopeless cases, and where an occasion arises to employ it for purposes of prevention,—*i.e.*, in injuries which have been contaminated with dirt or earth, and which have not received immediate attention or could not be thoroughly cleaned.

INDICATIONS FOR THE SURGICAL TREATMENT OF CHOLELITHIASIS.

GERSUNY gives the following indications for operation in cholelithiasis (*Wiener Medicinische Presse*, 1894, No. 47):

1. Imminent danger from bursting of the gall-bladder, obstruction of the intestine, beginning sepsis. If traces of sepsis are found, the necessity for operation becomes imperative. Such cases may be cured by expectant treatment, but the danger to life is greater than that incurred by the operation.

2. Frequent attacks of colic and persistent icterus. Marked frequency of the attacks make one apprehensive of danger to the patient. Further, the fact of permanent irritation is not to be underrated, because it may cause carcinoma. Persistent icterus results, as a rule, in the decline of the general health, so that one is obliged to operate to improve the nutrition of the patient.

3. Inability to work and constant pain. Even if there were no momentary danger to demand an operation, if the suffering of the patient prevents him from doing anything, surgical interference is indicated, especially if the patient is dependent upon his own exertions. —*American Journal of the Medical Sciences*, June, 1895.

BONE SUTURE IN FRACTURE OF THE LOWER END OF THE FEMUR.

WALTHER (*Médecine Moderne*, April 20, 1895) reports a case in which the lower extremity of the femur was broken into three fragments, and the tibia was displaced backward, carrying one fragment—the inner condyle—with it. The joint was freely exposed and the fragments reduced and sutured in position. Twelve months later the knee seemed rather large; functionally the result is perfect. The joint can be flexed to a right angle.—*British Medical Journal*, May 25, 1895.

THE TREATMENT OF FISTULÆ IN ANO BY LANGE'S METHOD OF IMMEDIATE SUTURE OF THE TRACT.

ADLER (*Medical News*, June 1, 1895) presents a brief paper on this subject, in which he says his experience justifies him in expressing an opinion of Lange's method of treating fistulæ in ano that is contrary to the unfavorable opinion of it held by the general surgeon and, in fact, by some rectal specialists. The condemnation of this operation is due to a misconception of its scope or range of applica-

bility rather than to a failure to accomplish the desired results in suitable cases. Fistulous tracts running high up into the bowel should not be treated by this plan, but in the majority of instances the sinuses are confined to the lower inch or so of the bowel. In such cases the technique to be described will often materially aid the healing process.

An inflexible rule to follow in all cases of fistulæ in ano cannot be given, as each case requires individual study and treatment.

Briefly stated, the method of treating the disease in question, as suggested by Dr. Frederick Lange, of New York City, consists in the excision of the entire fistulous tract and the apposition of the wound by buried sutures of catgut, in order to secure healing by first intention. Strict antiseptic precautions are, of course, observed. In the author's practice for the past two years he has pursued this treatment, with a few modifications, in nearly all the cases coming under observation that required operative interference. In no instance was there occasion to regret its employment. In those cases in which primary union was not secured, the immediate suturing of the fistulous tract prevented hemorrhage and lessened pain, the pain being occasioned sometimes by the packing of the sinus when sutures are not employed. Frequently a portion of the wound healed by first intention, and shortened that much the period of convalescence.

The special points in the operative technique that he follows are as follows: The sphincter muscles are thoroughly stretched. Instead of attempting to excise the entire fistulous tract or tracts, the wall of the incised fistula is thoroughly curetted, and the edges of the sinus are removed if at all indolent. Bleeding, if profuse, is temporarily controlled by torsion of the vessel or by the application of hot-water compresses. Silkworm-gut sutures are inserted in a similar manner to that employed in repairing a lacerated perineum, the sutures being passed at intervals of half an inch and about a quarter of an inch from the edge of the wound. It is a buried suture,—that is to say, no portion is exposed within the sinus. After all the sutures are inserted, they are tied with a single surgeon's knot. The ends of the gut should not be cut short, as they are liable to stick into the flesh. The tension exerted by the suture must not be excessive, only sufficient to bring the raw surfaces into accurate apposition. When more force than this is employed, the wound is puckered, and healing is either prevented or seriously retarded. Superficial sutures are used wherever the skin or mucous membrane is not closely united, especial attention being paid to this, in order to prevent the entrance of fæcal or foreign matter, which, should it occur, would prove disastrous to primary union. When the operation is completed, a suppository of 10 grains of iodoform, or 5 grains of aristol, is inserted into the bowel, and some of the dry powder is sprinkled over the external parts. A liberal supply of gauze and cotton and a T-bandage complete the dressing. No opium is given, if it is possible to avoid its use. The bowels are moved on the third day by the administration of small doses of calomel and sodium bicarbonate, followed by a saline. Immediately preceding the fæcal movement an enema of 6 or 8 ounces of olive oil is given. This lubricates the parts and softens the stool. Patients are kept in the recumbent position from ten days to two weeks, the length of time being proportionate to the extent and depth of the lesion. Tuberculous subjects improve most rapidly when not confined to bed longer than absolute prudence demands.

During the healing process two points require the surgeon's attention,—the burrowing or formation of fresh sinuses and the onset of pain. The development of burrowing, or the formation of fresh sinuses, is generally indicated by the sudden appearance of an increased amount of purulent discharge or by an induration of the tissues about the site of the former fistula. Upon discovering the seat of trouble, the requisite number of sutures should be removed, and any adhesions that interefere with the wound healing from the bottom should be broken down with a probe so as to allow free drainage, and the tracts should be kept perfectly clean by frequent syringing with hydrogen dioxide or some other antiseptic and pus-destroying solution. If a new sinus has formed, it should be opened at once.

Regarding the appearance of pain, Allingham states, "Always encourage your patient to tell you directly he has any pain in or near the healing fistula; never make light of his complaints; often he will be the first to discover, by the existence of some unpleasant sensation, the commencement of a small abscess or sinus, and will be able also to indicate its situation."

Unless otherwise indicated, the sutures are removed within ten days or two weeks; frequently a few are taken out within a week. It is best, however, to err on the side of leaving them in too long.

Even if primary union is not obtained, the patient will be in the same position as if no attempt had been made to secure it; whereas, if healing ensues, the gain is a considerable one.

COLLODION IN PLASTIC OPERATIONS.

In the *Boston Medical and Surgical Journal* for May 23, 1895, Dr. David Coggin, of Salem, in the correspondence columns, calls attention to the value of collodion in plastic surgery. By its use the inconvenience and pain of sutures can frequently be dispensed with. For example, when inversion of the lower eyelid is present, as is not uncommon in elderly people, and which naturally causes much annoyance, it is often sufficient (Noyes) to apply two or three coats of collodion on the skin below the inturned lashes, and repeat its application every two or three days for some weeks, till either relief follows or the patient consents to have a strip of skin excised. When the latter is done, fibres of cotton saturated with the collodion will keep the edges of the wound in perfect apposition during the healing process, sutures not being called for.

Its contractile property is also of value after the outscooping of cysts on the eyelids. They are ordinarily incised through the tarsal surface, and when evacuated the sac sometimes becomes much distended by hemorrhage, and occasionally an abscess is the sequel. Collodion applied on the skin over the site of the chalazion expels the blood and brings the walls together, and so promotes immediate union. This is favored by inserting a drop of castor oil in the line of the incision, which it tends to keep open for a day or two. He also again calls attention to the use of collodion on distended tear-sacs, in several instances of which it has helped in abridging the treatment of this not uncommon affection.

ON THE DIAGNOSIS OF RUPTURE OF THE INTESTINE.

Berndt states (*Deutsche Zeitschrift für Chirurgie*, Bd. xxxix., u. 5, Heft 6) that after a contusion of the abdomen the following conditions may be taken as indicative of rupture of the intestine:

1. The absence of liver dulness (Moritz).
2. Frequent and uncontrollable vomiting.
3. The appearance of peritonitis, if lesions of the kidney, bladder, liver, and spleen can be excluded.
4. Spontaneous pain in the abdomen is not of itself of much diagnostic value.

Regarding the advisability of operating in these cases, the author says,—

1. If there is unmistakable evidence of rupture of the intestine, immediate laparotomy is indicated.
2. Exploratory laparotomy after contusion of the abdomen is usually to be avoided; in uncertain cases expectant treatment should be adopted (Moty).
3. If soon after the injury (twenty-four to thirty hours) there are signs of sepsis, operation is contraindicated. A low temperature with marked constitutional symptoms is an especially unfavorable condition.
4. Rapidity and delicacy are essential in operating for rupture of the intestine, especially if peritonitis is present. Therefore a long abdominal incision and rapid, systematic examination of the intestine are indicated, avoiding rough tearing or handling. The intestine should be resected only in case of absolute necessity; it is better to close tears by simple Lembert sutures, or, at most, a wedge-shaped resection of the injured portion of intestine, and closure with a simple running suture, including the muscular and serous coats. Flushing the abdominal cavity with liquid is to be avoided.—*American Journal of the Medical Sciences*, June, 1895.

SIGMOIDO-PROCTOSTOMY.

At a recent meeting of the Johns Hopkins Medical Society, Kelly (*Bulletin of the Johns Hopkins Hospital*, 1895, vol. vi., No. 47, p. 30) reported the case of a woman, twenty-two years old, with a history of pelvic inflammatory disease accompanied with severe suffering, in which, in the course of operation, six centimetres of strictured rectum were removed. The lumen of the upper sigmoid portion was so wide and the rectal portion was so rigidly contracted that the injury could not be repaired by anastomosis. The operation was, therefore, concluded by suturing both of the divided ends of the bowel into the lower end of the abdominal incision, the sigmoid at the extreme lower angle and the rectum just above it.

On examination two months later, an opening about three centimetres was found above the symphysis pubis, at the bottom of which were two orifices, a larger one below, about two centimetres in diameter, through which the index finger passed readily up over the left iliac fossa in the direction of the descending colon. Immediately above this, separated by a narrow bridge of tissue, was a small orifice about one centimetre in diameter, into which the index finger was passed with difficulty. A long, tight stricture of the rectum from the abdominal wall down to a point behind the cervix uteri was found. The woman's suffering was increased after this examination, it

is thought, from rupture of the coats of the bowel through into the peritoneum on the right side.

A week later the entire scar containing the sigmoid and rectal orifices was dissected out, and these were separated and wrapped separately in gauze and laid aside. To reach the pelvic organs it was necessary to detach numerous loops of adherent coils of small intestine bound together by fresh exudate and bleeding freely. An opening was found in the strictured rectum below the promontory of the sacrum on the right, about two centimetres from the cut end and communicating with the peritoneal cavity. The uterus and ovary and tube were so covered with dense fibrinous adhesions that it was impossible at first to tell where they lay or decide from appearances which tube and ovary had been removed in the first operation. The uterus was finally discovered by cutting through the adhesions in the posterior part of the pelvis and evacuating an encysted peritoneal accumulation of one hundred and twenty cubic centimetres, when the left tube was found and the position of the uterus traced by it. The enucleation was then continued by following the contour of the uterus and stripping up the adhesions, digging it out of a bed of densely-organized lymph. The ovarian vessels were then ligated, the uterus amputated in its cervical portion just above the vaginal junction, after ligating both uterine arteries, and the stump of the cervix closed by antero-posterior silk sutures. The cleaned-out pelvis presented the appearance of a rough excavation without peritoneum.

The condition of the patient now became so alarming that the operation had to be brought to a speedy termination. Three centimetres of the upper part of the strictured rectum were removed, severing it below the rupture. The wedge-shaped flaps were approximated with silk sutures, closing its lumen. The end of the sigmoid was then caught with six long silk traction sutures through the peritoneal and muscular coats, entering about half a centimetre from the edge of the incision and emerging on the incision without piercing the mucosa. The walls of the bowel were from three to four millimetres thick and somewhat rigid, without flaccidity of the normal sigmoid.

An oblique incision about three centimetres long and directed from before backward and from left to right was now made into the rectum on the pelvic floor just above and behind the vagina, close to the cervix, below the lower end of the stricture. With a pair of long artery forceps passed through the anus and ampulla and out through the incision into the pelvic cavity, the six traction sutures were caught in a bunch and pulled down and out of the anus, drawing the sigmoid into the rectal incision, which was held open with forceps to facilitate the entrance. The bowel was kept from slipping back into the pelvis by grasping the traction sutures in the heel of the bite of the forceps lying across the anus in the gluteal furrow. The pelvis was washed out and a gauze pack inserted around the sigmoid, and another up among the inflamed bowels, and brought out at the lower angle of the incision, which was closed at this point.

The woman made an excellent recovery, and subsequently had normal bowel function. The purulent discharge constantly decreased after the removal of the pack from the lower end of the wound, and at no time was fæcal matter passed in any other way than by the anus.—*Medical News*, June 1, 1895.

TREATMENT OF TUBERCULOUS AFFECTIONS OF THE KNEE-JOINT.

HORACE MANCHESTER BROWN (*International Medical Magazine*, May, 1895) publishes a paper on the subject, of which the following points are emphasized:

1. That tuberculous disease of the knee-joint calls for treatment, the principle upon which that treatment depends being the same as that for any other condition in any part of the body in which there is existing as an exciting cause a microbic infection which is capable of producing either local or general retrograde metamorphosis of tissue.

2. It is also essential that the general condition of the patient in this disease should receive the most careful attention, inasmuch as the tendency of the disease, affecting, as it does, the largest joint synovial surface of the body, is towards rapid production of general sepsis and rapid diminution of general resistance to septic infection.

3. That while the contents of the knee-joint after perforation from a caseous focus in the epiphysis of the femur is not true pus, but, on the contrary, broken-down tissue containing tuberculous matter, there may at any time take place an infection of the joint from the development of staphylococci or streptococci, which may produce a general septicæmia.

4. All hope of successful treatment with the idea of preventing retrograde metamorphosis of tissue after a tuberculous nfection has taken

place in the bone will depend upon extremely early diagnosis, operations, rest, and improvement of the hygienic conditions.

5. All pus collections, wheresoever they may form as the result of infection of tuberculous material with pus cocci, should be evacuated, drained, disinfected, and curetted.

6. Early operation is indicated upon tuberculous abscesses occurring in the ends of the bones, and suspicion should be attached to any continued pain in the epiphyseal region in children after injury which does not disappear after a few weeks of rest.

7. Immobilization of the knee, but not by means of plaster dressings, is indicated in all suspicious cases of osteitis occurring in the neighborhood of the joint.

8. An attempt should always be made to bring about progressive metamorphosis of tissue by injections of iodoform emulsions, either in glycerin or ether, when the progress of the disease has not been so great as to indicate that the intrascapular tissues are entirely destroyed.

9. Arthrectomy and arthrotomy are contra-indicated in cases where excessive emaciation and extreme anæmia, or the occurrence of foci of tuberculous disease in distant organs, indicate that there is a general condition of tuberculosis.

10. Arthrectomy or arthrotomy is indicated when the disease seems to be limited to the joint or the periscapular tissues, and when the patient's condition is such that it is safe to believe that the shock of the operation can be withstood. Great care is to be exercised in attempting to break up an anchylosis, lest the disease, not entirely eradicated, be started anew, or new fracture be produced.

11. Amputation is indicated when the disease shows no tendency to local improvement and the progress of the disease is rapid and unmanageable, as in the liquefying form of tuberculosis.

SPLENOPEXY.

At the German Surgical Congress, RYDYGIER, of Cracow, reported that he had successfully performed splenopexy three months before on a patient with a movable spleen. Splenopexy is a difficult operation on account of the danger of hemorrhage. Rydygier made an incision in the median line and dissected up the peritoneum at the level of the eleventh and twelfth ribs, so making a pocket in which he lodged and fixed the spleen. The fixation sutures were passed through the gastro-splenic ligament. Up to the time of report the spleen had remained in place.—*Boston Medical and Surgical Journal*, May 23, 1895.

RESTORATION OF JOINT FUNCTION AFTER FRACTURE.

ROBERTS (*Philadelphia Polyclinic*, June 8, 1895) calls attention to the fact that fractures near joints, but not actually involving the joint cavity, seldom lead to anchylosis, though some temporary muscular stiffness may exist for a few weeks after fracture dressings have been discarded.

This proposition indicates that retentive apparatus in such fractures should be dispensed with as early as circumstances will permit, so that the stiffness of immobilized joints may be as insignificant and of as short duration as possible.

Fracture dressings which maintain perfect coaptation of fragments without restricting the motion of contiguous joints are, when other circumstances permit their use, preferable to other dressings which prevent the patient from using these joints.

When joint cavities are invaded by lines of fracture which do not cause deformity of the articular surfaces or changes of bony contour near these surfaces, anchylosis is uncommon, unless infection leads to severe synovitis or arthritis.

Permanent loss of motion, partial or complete, after fractures involving joints, usually depends on imperfectly reduced fragments or on a synovitis or arthritis caused by septic infection or unwise passive motion.

Early passive motion adds to the traumatism in fractures involving joints, and may thereby increase the formation of intra-articular fibrous adhesions. In aseptic cases it is unnecessary; in cases in which readjustment of the fragments is imperfect it does no good; in septic cases it increases irritation and does harm. It should, therefore, not often be employed.

Late passive motion is desirable to hasten the return of functional usefulness in joints stiffened by muscular rigidity after the fracture apparatus has been removed. It is also serviceable to break up intra-articular fibrous adhesions due to synovitis or arthritis resulting from fractures.

Massage, soaking in hot water, frictions with liniments, electricity, passive motion, and attempts at voluntary movement, continued for months, will often cause great improvement in the functional usefulness of joints supposed to be irretrievably damaged through fracture.

RUPTURE OF THE URETHRA, ACCOMPANIED BY EXTENSIVE EXTRAVASATION OF URINE, SUCCESSFULLY TREATED BY PERINEAL SECTION AND RETROGRADE CATHETERIZATION.

Retrograde catheterization was first performed by Verguin in 1757 by the introduction of a catheter into the urethra through a pre-existent fistula of the bladder. Sedillot, writing upon the subject, expresses the belief that a retrograde catheterization is the proper course to pursue in cases of impassable strictures, or rupture of the urethra, in which the posterior end of the urethra cannot be found after making the incision in the perineum.

Retrograde catheterization is not of frequent necessity, but the successful termination of several operations of this kind that HORWITZ (*Philadelphia Polyclinic*, vol. iv., No. 22) has witnessed, and the experience that he had with a case which he gives in detail, lead to the inference that the surgeon should not hesitate to resort to this procedure if inordinate difficulty is experienced in finding the distal end of the urethra.

A careful analysis of the case reported would seem to justify the following conclusions:

1. In cases of impassable stricture, especially if we are warranted in suspecting the existence of diseased kidneys, or in cases of rupture of the urethra, with indications for perineal section, should there be any difficulty in finding the distal end of the urethra, rather than prolong the operation, it is safer to perform retrograde catheterization with as little delay as practicable.

2. In cases of retention of urine, where the bladder is distended and suprapubic cystotomy becomes necessary, the operation is very simple, and requires but a few minutes for its accomplishment, and little time need be lost in resorting to retrograde catheterization.

Should the bladder be emptied, or contain but a small quantity of urine, the procedure is more difficult, and a longer time is needed. The patient should be placed in Trendelenburg's position. Great care is to be observed not to injure the peritoneum, which, in this condition, lies directly over the viscus; by taking the pubic bone as a guide, and going directly downward, the bladder can be easily found and the serous membrane covering it can readily be pushed out of the way by means of the forefinger or the Allis dry dissector.

3. When the urine has escaped from the bladder, and it is desirable to pass a catheter through the vesical orifice of the urethra, the operation is facilitated by first distending the rectum by means of the rectal bag.

4. External perineal urethrotomy without a guide, when there is an impassable stricture or a ruptured urethra, is far from a simple operation; a good, steady, strong light and infinite patience are needed to insure success.

5. Time is saved and the operation much simplified by using the modified perineal staff of Horwitz.

6. Much valuable time is often lost by the attempts of the operator to ligate bleeding vessels which lie in the deeper-seated portions of the wound, embedded in cicatricial tissue. In a number of operations of the kind that we have recently performed no effort was made to ligate these deep vessels. Hæmostatic forceps were applied and allowed to remain *in situ* for from twenty-four to forty-eight hours. By resorting to this method of procedure no difficulty was experienced, and the operation was completed in one-half the time otherwise required. Horwitz has frequently allowed from six to eight forceps to remain in a wound at one time.

7. We cannot too strongly urge upon the profession that failure to give permanent relief in many cases of external urethrotomy is owing to the fact that many operators allow the catheter to be removed on the fourth or fifth day, so that by the time the individual is ready to leave the institution, the urethra, which just after the operation would have tolerated a full-sized instrument, has contracted to such a degree that only a very small bougie can be introduced, inserted with difficulty and giving rise to much pain. After leaving the hospital the patient usually neglects to have an instrument regularly passed, and in the course of twelve months the stricture has contracted to such a degree that more frequently than otherwise the operation has to be repeated.

In the last seventeen cases upon which the author operated a full-sized catheter was inserted, tied in place, and allowed to remain in position until the perineal wound was healed, usually requiring a period of from four to six weeks. The instrument must have attached to it a rubber tube, to be carried to a vessel underneath the bedstead, so that the patient and the bedclothes may be kept dry.

The catheter and urethra are to be daily irrigated with a warm solution of boric acid in the proportion of ten grains of the acid to the ounce of water.

The number of cases that we have successfully treated by this method warrants the conclusion that the suggestion is valuable, and in

commending it to the profession we are recommending a means of substituting for a diseased or contracted urethra one of full caliber; for if the catheter be allowed to remain in position until the wound is closed, not only is the patient dry and comfortable, but a new urethra forms around the instrument which, when removed, may be replaced by a full-sized bougie which can be passed with ease. This the patient should continue to use, at first as frequently as twice a week, later once a week, and finally once a month, the practice to be continued during his lifetime,—that is, if he wishes to avoid future trouble.

REMARKS ON THE SURGERY OF THE RECTUM.

Under this heading, PITTS (*Lancet*, May 18, 1895) gives emphasis to the following facts, and reports eight cases operated upon by himself which illustrate the practical application of the principles laid down:

The surgery of the rectum, especially as regards treatment, has undergone many changes during the last few years, and his object is to touch briefly upon points which appear specially to invite discussion. Since the adoption of scrupulous cleanliness in all details of operative surgery, rectal surgery has been stripped of its dangers. The great majority of operations are free from risk to the patient and from anxiety to the surgeon. The natural tendency has, therefore, been to aim at shortening the period of convalescence and at the same time to make the cure as radical as possible. Unfortunately, students during their hospital career cannot have many opportunities either for the examination of rectal complaints or for the close observation of operative manipulations, since the part does not allow of numerous examinations. Consequently, medical men are apt to begin practice with the idea that there is something about rectal surgery which is mysterious and requiring special study. The same amount of care and attention and experience is requisite as for the surgery of any other part of the body; the same laws hold good; the diagnosis is, if anything, easier to make than it is in affections of most other regions of the body; and the results after treatment are more certainly successful. The three most common conditions are fissure, fistula, and hemorrhoids. Instead of the partial operation formerly practised, the aim now is the complete removal of disease, and, so far as can be done with safety, the immediate healing of the wounds; in other words, to deal with disease of the rectum in much the same manner as with a similar affection in most other parts of the body. Complete dilatation of the sphincter is quite sufficient to cure many cases of fissure of the anus; but when the disease is chronic, and the ulcer has an indurated base, its complete excision is more satisfactory than the linear incision formerly recommended. Suturing the small wound left after excision, so as to obtain immediate union, is not often successful, and personally the writer has given it up, for the raw surface is so shallow and narrow that the union obtained is pretty certain to break down when the bowels are allowed to act. In simple cases of fistula a complete resection of all cicatricial and sinus tissue shortens the period of convalescence very greatly, and he has never seen any harm arise when the parts are kept clean and packed with iodoform gauze. When the external opening is at some distance from the anus, and after excision a large deep wound is left, deep sutures to bring the sides of the chasm into direct approximation may repay the trouble taken, and a cure be brought about in a quarter of the time otherwise required. The wound must of course be carefully watched, and the sutures removed if the part becomes contaminated. With ordinary precautions there is no increased risk in such an attempt at direct union; in fact, to put the matter shortly, "there is everything to gain and nothing to lose." Sutures are not advisable when the incision extends far up the bowel. In complicated cases of fistula, when the sinus extends round the bowel, or many secondary sinuses extend into the surrounding structures, a complete removal of all involved tissue should not be attempted. After freely laying the sinuses open, it is best to be content with a free scraping of the lining membrane and the local application of some strong disinfectant, such as chloride of zinc, 40 grains to the ounce. When a fistula is of tuberculous origin, and it is thought desirable to interfere, it is of special importance that the removal of all affected tissue should be completely carried out; unless this is done the wound cannot be expected to heal, and the patient's condition will in all probability be rendered worse. It is advisable to enter into a discussion on the question of operation in chronic phthisis; but it is true that such interference often turns out badly, because half measures have been adopted and the whole of the infected tissue has not been removed.

The three chief operative methods at present in use for the cure of internal hemorrhoids are

the clamp and cautery, ligature, and excision. The pressure clamp is only spoken of to be condemned as universally unreliable. The clamp and cautery treatment still has some advocates, but with the improvement in the preparation of silk ligatures the cautery is now not often employed. By means of the ligature many forms of hemorrhoids can be safely and satisfactorily treated; but the profession is indebted to Whitehead, of Manchester, for introducing the more complete surgical procedure of excision of what he describes as the "pile-bearing area." This method is not necessary in the majority of cases. When hemorrhoids are polypoid in character and have healthy mucous membrane intervening, they can be quickly and efficiently removed by the ligature. In some cases, however, the whole circumference of the mucous membrane just within the white line is involved, and the condition is associated before or after stretching of the sphincter with prolapse of the unaffected mucous membrane above. A thoroughly radical treatment cannot then be carried out by means of the ligature, and Whitehead's operation gives the most admirable results. It is curious that excision has not been more generally adopted in this class of cases by surgeons. Some, indeed, after a limited trial, have written against excision as an unnecessarily severe operation, involving the expenditure of time and the loss of blood, and likely to lead to stricture if the union at the line of suture fails and the bowel retracts. This is all very reasonable against the indiscriminate adoption of the method, but it does not in the least apply when suitable cases are chosen. The author has adopted Whitehead's method in about thirty cases, and is convinced that when there is a complete ring of hemorrhoidal tissue attended with prolapse to deal with, it is the most satisfactory operation to perform. Failure to get a good result depends either upon the selection of an unsuitable case or upon a careless and imperfectly performed operation. The separation with scissors must be carried sufficiently high to allow the outer edge of mucous membrane to be sutured to the skin with absolutely no tension. There is no occasion to hurry over the operation, and a skilled assistant is most desirable. Personally, the writer does not trust the sutures to arrest hemorrhage, but uses ligature for the bleeding-points, employing very fine silk. The wound must be thoroughly disinfected and made dry before the sutures are tightened up. By a little extra expenditure of time a comparatively bloodless operation may be performed, and the risks of after hemorrhage are certainly less than by any method of ligature *en masse*. The sutures may be left to find their own way out, and should not be removed unless any particular one is causing irritation. In but one case did he fail to get immediate union, and the cause of failure in this case was the too free removal of redundant skin. In several instances his patients have been medical men, and they have been surprised at the small amount of after-discomfort, the painless evacuation of the bowels on the third and fourth days, and convalescence on the tenth day, together with the rapid regaining of proper control over the motions. If immediate union of healthy mucous membrane to skin can be assured, it is obvious that the patient has less chance of stricture than if a considerable portion of mucous membrane be destroyed by cautery or sacrificed by wholesale ligation. Since the internal and external sphincters are left intact, control over the contents of the rectum is no more endangered than by any other method of treatment, and as the whole of the pile-bearing area is removed, the chances of relapse must be practically eliminated. Owing to the unavoidable interference with the nerve-supply at the anal margin a partial anæsthesia is often present for a little time, and if the patient has diarrhœa he may not be fully conscious of the presence of a little moisture about the anus, and this is the only objection which, so far, has any practical reality.

Congenital stenosis of the anus or rectum, when complete, demands immediate attention, and can often be remedied by perineal exploration and after persistent dilatation. The writer speaks only of (1) when the rectum ends by an opening into the floor of the prostatic or membranous urethra, and (2) when the rectum opens into the vagina. In the first condition an inguinal colotomy may save the child for a time, but death is likely soon to ensue from cystitis and surgical kidneys. In three cases under his care he has successfully relieved the distended bowel in this way, death occurring in from two to eight weeks from marasmus and cystitis, and at the necropsy in each case multiple abscesses were present in the kidneys. The abscesses were numerous, but quite small, none of them being larger than a pea. The only way to avoid this complication would seem to be by dividing the sigmoid flexure, and so preventing any fæcal matter from gaining access to the bladder. When a colotomy has to be performed because a perineal exploration has failed, and there is no evidence of a communication with the urinary passages, such later

attempt to establish the perineal route might be successful, but it is only inviting disaster to strive for continuity of the bowel when meconium is being discharged from the penis. When the rectum opens into the vagina it is not uncommon to leave the abnormality alone and to wait for a few years, unless actual obstruction of the bowel ensues. Great harm may thus result from imperfect evacuation; the rectum and colon are likely to become enormously dilated, and permanent damage to their propulsive power may result.

TREATMENT OF TONGUE TIE.

DR. CHERVIN (Paris, 1894), the director of the Institute for the Treatment of Stammerers, at Paris, made an interesting study of the surgical aspect of frænum cutting. Much performed in certain regions of France, and formerly often done by some of the greatest surgeons, he thinks that its use has a very limited application; for example, in those rare cases where the tongue is bound down to the floor of the mouth by an inferior anchyloglossia, so that the tongue is immobilized. In certain cases where the frænum is too long, extending even to the tip of the tongue, excision is required. This is exceptionally necessary, and, though in itself insignificant, it may present serious danger in a little child. It is wrong to think that if an infant nurses badly its frænum must be cut. A little exercise upon the end of one's finger will correct this fault, and operative interference will be unrequired. Cutting the frænum is absolutely useless in correcting defective pronunciation, for this is only to be remedied by a methodical education of the voice by natural and rational exercises. —*Practitioner*, June, 1895.

LAPAROTOMY IN ABDOMINAL INJURIES.

SORGE (*Rif. Med.*, March 26, 1895) gives brief notes of fourteen cases of abdominal injury (stabs, gunshot wounds, etc.) in which he performed laparotomy as soon as possible after the injury. Nine out of the fourteen recovered. Of the five deaths, two were due to hemorrhage (one very severe, from the injury itself, and the other from hemorrhage of the tenth intercostal artery, the wound of which was not detected at the time of operation), one to septic infection (general peritonitis had set in before the operation), one to collapse due to the severity of the injury (gunshot wound in the ninth intercostal space, piercing diaphragm and injuring spleen and stomach), and one to collapse due to fatty degeneration of the heart. In four only of the fourteen cases was the laparotomy a simple exploration. The author advises laparotomy in all cases when it is clear that the wound has penetrated the abdomen, unless peritonitis has set in, when operation does more harm than good. It is difficult always to be sure whether a wound has penetrated the abdominal cavity or not; in such cases it is better to enlarge the wound and see; one cannot trust to physical or functional symptoms. The most frequent certain sign of penetration is hernia of the epiploon (four in fourteen). If laparotomy be necessary, it should be done on the site of the wound, using a simple longitudinal T-shaped or 7-shaped incision. When the thorax is injured, it is better to dilate the wound, do subperiosteal resection of rib, enlarge the wound in the diaphragm, and then suture in mass. In laparotomy the author uses separate sutures for the different coats of the abdomen. Laparotomy, if done rapidly, is not a dangerous operation in the class of cases Sorge is dealing with; in the case of gunshot wounds, if in doubt as to whether internal organs are injured or not, he advises laparotomy.—*British Medical Journal*, May 25, 1895.

LACERATION OF THE CERVIX UTERI.

PENROSE (*University Medical Magazine*, June, 1895) calls attention to the importance of diagnosticating as early as possible between a bad laceration of the cervix uteri with erosion, and beginning cancer of the cervix. Cancer of the cervix in practically all cases occurs in an old laceration. All statistics show this. Cancer of the cervix is a disease of childbearing women. One series of statistics shows that the average number of children per woman with cancer of the cervix is five,—an unusually large average productivity. For this reason he thinks that all, except the slightest lacerations of the cervix uteri, should be closed, so that when the woman reaches the menopause, the age of the greatest liability to cancer, the cervix uteri may not present a spot of least vital resistance favorable for the development of this disease. But this is prophylactic medicine. Contrasted with these cases are those in which cancer has already begun in an old laceration,—the cases on the border line between chronic, deep seated, non-malignant disease of the cervix, the result of laceration, and the earliest stages of malignant disease. It is of the greatest importance that we recognize these cases early. The importance of this

early diagnosis cannot be overrated. Upon it depends the life of the woman. If it is recognized early, hysterectomy promises cure in the majority of cases; while, if the diagnosis is delayed for a few months, the case becomes hopeless with our present surgical methods.

If the physician has even the slightest suspicion of malignant disease in a case of laceration of the cervix uteri, he is criminal if he idly waits developments. There are two methods by which the early diagnosis may be made. If with local treatment, as puncture, tincture of iodine, glycerin, and douches, the condition improves and the suspicious appearance disappears, the disease is not beginning cancer. Or we have even a quicker test by microscopic examination of a portion of excised tissue. The suspected tissue should be hooked up with a tenaculum and a wedge-shaped piece cut out with curved scissors. This is practically painless and can be done without ether.

The author has in this way on several occasions diagnosticated cancer in the very earliest stages.

ON ABSORBENT DRESSINGS, ASEPTIC AND CHEAP.

NEVE (*Lancet*, April 27, 1895) calls attention to the fact that the French War Department has adopted peat as the best cheap absorbent dressing. Peat moss appears to have been used successfully in Russia for the last ten years. Suggested by Leisrink, it was soon used by Schede, Hagedorn, and others. The writer tried it for a time, but soon returned to sawdust pads, which have now been the staple dressing material for over ten years at this station, the Kashmir Mission Hospital, India. Thomas, of Liverpool, and others have used them in England. These have now been introduced by Surgeon-Lieutenant-Colonel Lawrie into the hospitals and dispensaries of Hyderabad State. They are cheap. The muslin bags and sawdust are very low priced. The pads are impregnated the day before use with a 1 in 2000 solution of mercuric zinc cyanide. They can be easily sterilized in a Cathcart's or Schimmelbusch's oven. They are absorbent, but not too drying. Surgeons who have used moss have found it too drying, as the discharges crust beneath it, and the moss needs damping from time to time. Sawdust pads will absorb twice their own weight of pus or serous discharge. Absorbent wool frequently allows a small amount of discharge to penetrate to the bandages. This seldom happens with well-adjusted pads. They are exceedingly light and comfortable, and, if well made, adapt themselves to the shape of any surface. The sawdust should not be too fine or the muslin too coarse.

CONTRACTED ELBOW, WRIST, AND FINGERS FOLLOWING PRESSURE ON MEDIAN NERVE BY SCAR TISSUE.

TUBBY (*Lancet*, May 4, 1895) reports a case with the above title which is of considerable surgical interest on account of the cause of the contraction and its duration, the difficulty of finding the site of lesion of the nerve, and the extensive dissection required; but chiefly it is of value as showing that clean division of all the tendons on the flexor aspect of the wrist gives a satisfactory result, and that both flexion and extension of the fingers can be fully restored after so radical a procedure. The details of the case are as follows:

A girl, aged four years, was brought to the National Orthopædic Hospital on October 20, 1893, with the history that one year previously she injured the front of the right forearm. She was taken to the German Hospital; but beyond the fact that splints were applied and that subsequently some matter came from the forearm, no further details could be obtained. On examination the right elbow was found to be partially, the forearm fully, pronated and the wrist flexed, the thumb and first and second fingers were forcibly bent into the palm, and the third and fourth fingers less so. Sensation was impaired in the outer part of the palm and on the palmar aspect of the thumb and first and second fingers. There was, however, no glossiness of the skin, and the nails were intact. On attempting passive movement it was found impossible to either supinate the forearm or extend the wrist, thumb, and first and second fingers, but the third and fourth fingers could be passively moved through an angle of about 20°. About one inch below the bend of the elbow and in the middle line, at the anterior aspect of the forearm, a depressed scar half an inch in diameter was seen. It was somewhat firmly adherent to the deeper structures. Judging from the appearances presented by the limb, the writer thought that the history of the case might be somewhat as follows: injury to the upper end of the ulna, followed by suppuration and pressure, either of a small amount of callus or scar tissue on the median nerve, just after it had passed through the two heads of the pronator radii teres. This idea received confirmation on writing to the German Hospital.

In the reply to his letter the house surgeon gave the following details: The patient was admitted on May 20, and left the hospital on June 12, 1893. The history of the accident was, that the forearm had received a blow on the anterior part of the ulna, accompanied by considerable bruising. Suppuration had followed, and when the wound had healed the forearm was seen to be flexed and pronated, and the wrist could not be extended. The child was taken into the National Orthopædic Hospital, and for a month douching with hot and cold water, friction, passive movements, and galvanism were persevered in, but no improvement was noted. He then decided to operate, hoping to find the nerve lesion in the neighborhood of the elbow-joint. He commenced his incision just above the bend of the elbow and in the centre of the flexor aspect, and carried it towards the hand for four inches. The median nerve was found at the bend of the elbow and traced downward between the heads of the pronator radii teres until it disappeared beneath the flexor carpi radialis; but it was quite healthy in this region. The incision was then lengthened for two and a half inches, and the flexor carpi radialis cut through at its centre and the ends turned upward and downward. The opportunity so afforded was now taken to examine the anterior interosseous nerve in a part of its course; but that, too, was healthy. The median nerve was still further traced out, and at two inches and a half above the wrist was found to enter a mass of dense scar tissue. When freed from this the nerve-trunk was opaque in color for an inch of its course and shrunken to half its natural extent. The scar tissue was carefully removed, the two portions of the flexor carpi radialis united by gut sutures, and the wound was closed, a few threads of horse-hair being left in the centre to serve as a drain. This drain was removed on the fourth day, when it was found that primary union had taken place. At the end of the tenth day all the sutures were taken out, as the edges were firmly united. The results two months afterwards were, that supination and extension were much increased, doubtless owing to division of the flexor carpi radialis at the operation, but the movements of the fingers and wrist were not much improved. It was, therefore, decided to divide the flexor tendons of the wrist. This he proceeded to do by prolonging the former incision to the junction of the forearm and hand, finding the median nerve, and passing a blunt pointed tenotomy-knife underneath it. He cut firmly downward towards the bone, dividing every tendon which offered any opposition to extension of the fingers and thumb. He thinks that the palmaris longus, the flexor sublimis and profundus digitorum, and the flexor longus pollicis tendons were completely severed. No attempts were made either to bring the divided ends into apposition nor to unite the proximal to the proper distal parts. The hand and fingers were placed upon a malleable iron splint in the position they occupied before the second operation,—that is, the wrist and fingers were fully flexed. In ten days' time the splint was removed and the wound was found to be soundly healed. The forearm and hand were then placed in a gauntlet of plaster of Paris, with the wrist flexed and the fingers and thumb bandaged into the palm. At the expiration of ten weeks after the operation gentle extension of the fingers and thumb was begun, and the movement gradually increased till full extension could be obtained. The child was sent out of the hospital wearing a plaster-of-Paris gauntlet, which still kept the wrist flexed, but left the thumb and fingers free. At this time considerable active movement had returned to the hand. For a further period of six months the gauntlet was worn, the little patient coming up twice a week for friction and galvanism.

A year afterwards the movements of the right forearm and hand were completely restored and the parts were in good position. She could use a knife and a spoon well, write on a slate, and pick up small objects from the table, such as a pin.

ANTICANCEROUS SERUM.

EMMERICH and SCHALL (*Deutsche Med. Wochenschrift*, No. 17) inject serum taken from the blood of a sheep. The animal, having been previously inoculated with the erysipelatous streptococcus, is bled, and the blood thus obtained, when passed through a Chamberland filter, is ready for use.

The dose varies from ½ to 25 cubic centimetres, given every day or every other day, depending upon the size of the tumor and the reaction that occurs. The usual dose, however, varies from ½ to 4 cubic centimetres, and causes no pain. When larger quantities are injected, pain may continue for a few hours.

Fever following an injection is rare, and it never goes very high, even after very large amounts are employed.

Locally, the reaction is spoken of as a pseudo-erysipelas, which disappears in from twenty-four to forty-eight hours. Seven cases

were treated by the authors, and the results were satisfactory, though time enough has not elapsed to say if the cure is complete or permanent.

Sero-therapy for the cure of cancer finds its best indication in the recurring tumor following the employment of the knife.—*La Tribune Médicale*, May 22, 1895.

TREATMENT OF BUBOES.

A practical method of securing compression in the treatment of buboes is recommended by NEEBE (*Monatschefte für Prak. Dermatologie*, May 15, 1895). He uses a ball of wool half again as large as a man's fist, which he places over the enlarged gland and binds in place by a firmly applied spica of the groin. To avoid slipping from its proper position, a few large safety-pins are placed in the bandage and through a part of the ball of wool.

The author has employed this method for two years in buboes of all sizes, and reports but one case of pus-formation.

A NEW METHOD OF GENERAL NARCOSIS.

ROSENBERG (*Deutsche Medicinische Wochenschrift*, No. 50, 1894) described a new method of inducing general narcosis. Before commencing the anæsthetic, the patient's nasal mucous membrane is to be sprayed with a ten-per-cent. solution of cocaine. During prolonged anæsthesia the spraying is to be repeated every thirty minutes, and again at the end of the operation, no matter how short. His conclusions are:

1. Excluding cases of negligence and of poisoning, cardiac syncope in narcosis is, in so far as it can be attributed to the chloroform, reflex.

2. The syncope and the accompanying respiratory embarrassment are due to irritation of the peripheral trigeminal filaments in the nasal mucous membrane.

3. Every anæsthetic inhaled produces the same reflex symptoms as chloroform.

4. By proper cocainization of the nasal mucous membrane all such reflexes can be positively prevented.

5. Thus a greater part of the dangers of inhalation anæsthesia, particularly of chloroform, can be removed.

6. Cocaine possesses a certain action antidotal or antitoxic to chloroform, and thus further reduces the dangers of chloroform.

7. Chloroform in such cases is to be preferred to ether, as being less dangerous. The chloroform must always be administered drop by drop.—*University Medical Magazine*, June, 1895.

Reviews.

THE EXTRA-PHARMACOPŒIA. By William Martindale, F.C.S. With a therapeutic index and references, by W. Wynn Westcott, M.B. (Lond.). Eighth edition.

London: H. K. Lewis, 1895.

We have in past years given the most favorable reviews of previous editions of this excellent little hand-book, which is so small as to be readily carried in the coat-pocket, and which contains a very large amount of useful information, in addition to the many references which it gives to therapeutic literature, past and present.

The eighth edition has been prepared in anticipation of the production of the new British Pharmacopœia, and the authors tell us that, as one of them is associated with the preparation of that work of reference, a large amount of valuable information has been accumulated for both works.

In the present edition they have inserted a special chapter upon Antitoxins, Serums and Lymphs, and on Animal Glands and Tissues, and their preparations, and they have also been careful to introduce valuable information derived from the new Pharmacopœias of the United States, Italy, Switzerland, Denmark, and Japan. One hundred and ten pages of new matter have been added.

This is one of the few books printed in England and dealing with the preparation of drugs and their administration which can be heartily recommended to the American physician as a *vade-mecum*.

INDIGESTION. AN INTRODUCTION TO THE STUDY OF DISEASES OF THE STOMACH. By George Herschell, M.D. (Lond.). Second edition.

New York: G. P. Putnam's Sons, 1895.

This interesting little book begins with a chapter upon Normal Digestion, and then discusses indigestion, what it is, and the conditions in which it occurs. From this subject the author passes on to a consideration of the questions which should be addressed to the patient when the physician is attempting to get a good history of the case. By natural progression the next chapter is upon the Physical Examination of the Patient, the next upon the Causes, Symptoms, and Diagnosis of the Chief Diseases of the Stomach, and the sixth chapter

upon Treatment, while the seventh gives illustrative cases.

The book concludes with a bibliography and general index, the bibliography being extensive.

KISSINGEN SPA. THE INTERNATIONAL HEALTH RESORT IN ITS MEDICAL AND SOCIAL ASPECTS.
Munich: 1895.

This is a little brochure of less than a hundred pages, which consists of chapters upon the Kissingen waters and their chemical composition, with a description of the various methods of applying the waters in therapeutics and the diseases to which they are best suited. To the physician who is thinking of sending his patient to Kissingen, or to any other similar spring, this little volume contains very interesting and much valuable information. While the springs are recommended in a larger number of ailments than they can accomplish good, it is interesting to learn that they seem most valuable in chronic catarrhs of the alimentary canal, or in congestion of the liver and spleen, while rickets, chlorosis, and gout also seem to be benefited. The diseases which are contraindicated by Kissingen are advanced tubercular disease, cancer, chronic Bright's, long-standing locomotor ataxia, heart-disease with failure of compensation, epilepsy and insanity, and idiopathic neuralgia (if such a thing exists).

THE PATHOLOGY AND TREATMENT OF DISEASES OF THE SKIN. FOR PRACTITIONERS AND STUDENTS. By Moriz Kaposi, M.D. Copiously illustrated. Translated from the last German edition under the supervision of James C. Johnston, M.D.
New York: William Wood & Co., 1895.

In the preface to this valuable book—a preface written by Dr. George Henry Fox—mention is made of the wonderful advances which have been made in the study of dermatology during the last generation. These advances are due primarily to the active work of Ferdinand Hebra, and have been well carried out to their fruition by his successor, the author of the volume now under review.

The style of the book, which is given in the form of lectures, is clear, concise, accurate, and interesting. The illustrations, of which some are colored, are quite up to those which decorate recent standard books on dermatology by American or English authors, and the volume contains not only the description of common forms of skin-disease, but of the rarer lesions. It is to be regretted that in some places the German terms for drugs are given rather than the American formula. In certain cases this is unavoidable, but in other cases a translation would have rendered the book more useful. As the volume contains nearly seven hundred pages, it may be regarded as a complete and exhaustive work upon the important subject of which it treats.

THE CARE OF THE BABY. A MANUAL FOR MOTHERS AND NURSES. By J. P. Crozer Griffith, M.D.
Philadelphia: W. B. Saunders, 1895.

Dr. Starr's book on the "Hygiene of the Nursery" has been for so many years a guide-book to the mother and nurse that we examine with interest this volume, which has been written by his successor at the University of Pennsylvania. It is a somewhat larger book than that of Dr. Starr and contains a wider range of information. Whether this greater scope is of advantange or disadvantage remains to be proved by its popularity.

In the eleven chapters which comprise the volume we find that the author treats of the subjects, "Before the Baby Comes," "The Baby," "The Baby's Growth," "The Baby's Toilet," "The Baby's Clothes," "Feeding and Sleep," "Exercise, Mental and Physical," "Nurses," "The Baby's Room," and "The Sick Baby."

There is no more difficult task for the medical man than the writing of a book which, on the one hand, is not too scientific, and, on the other, so elementary as to be what might be called too popular. There is much in this volume that will be of interest to the mother and nurse and to the doctor; on the other hand, there are certain directions and illustrations which we do not think are useful. Those which illustrate various types of contagious disease are certainly without value, simply because it is impossible to represent in black and white illustrations the eruption of any one of the exanthemata.

We note with interest that the author evidently regards diphtheria and membranous laryngitis as identical diseases.

We do not think that the portion of the book in which prescriptions are given for use by the nurse or mother is an advantage, as it tends to household prescribing through the druggist, and to the possibility of errors being made in copying the prescriptions, or, what is equally dangerous, the application of these prescriptions to conditions which are supposed to exist, but which really require very different medication.

Under the antidote for phosphorus we find that sulphate of copper is still recommended, and that it is to be given freely, although it has been proved that this antidote is almost as

dangerous as the original poison. French oil of turpentine is also recommended, but is not to be obtained and is useless.

SKIASCOPY AND ITS PRACTICAL APPLICATION TO THE STUDY OF REFRACTION. By Edward Jackson, A.M., M.D. With twenty-six illustrations.
Philadelphia; The Edwards and Docker Company, 1895.

This is a capital book. It is the work of one perfectly familiar with his subject and perfectly able to impart his knowledge to those who desire to learn. Dr. Jackson prefers the term "skiascopy," and indicates the inaccuracy, on the one hand, and the inappropriateness, on the other, of some of the terms which are commonly used to describe this test for ametropia. In the early portion of the book he very properly dwells upon the difficulties of the method and the necessity of conscientious attention to details if the highest degree of accuracy is to be obtained.

Chapter II. contains a concise and easily understood description of the optical principles which are involved. This is followed by a chapter on the conditions which secure the accuracy to which reference has been made, and we would particularly commend this portion of the monograph to those who would become proficient skiascopists. In the pages which follow, regular astigmatism, aberrant and irregular astigmatism, and the practical applications with the plane mirror are discussed. The book concludes with a chapter on the use of the concave mirror and some final paragraphs on the best kind of apparatus to be employed in skiascopy.

There is no doubt that in skilful hands skiascopy is the most accurate objective test which we possess for the examination of ametropia, but, as Dr. Jackson puts it, "the limits of its accuracy depend upon the details of its execution and the skill and patience of the observer." It should not be used to the exclusion of other tests.

Those ophthalmologists who are content to correct errors of refraction by making a fairly good guess at the amount of corneal astigmatism with the aid of an ophthalmometer, or those who are satisfied to depend alone upon the answers of patients in the selection of proper glasses, probably will not be interested in Dr. Jackson's book. Those who are eager to employ all methods and thereby obtain the best results, and we trust they represent the majority, will find in Dr. Jackson's monograph exactly what they want with reference to skiascopy.

Correspondence.

CONCERNING THE PRACTICAL VALUE OF "MYDRIASIS AS A DIAGNOSTIC AND THERAPEUTIC MEASURE IN GENERAL DISEASE."

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—In an editorial article recently, in the *Medical News*, under the caption, "Mydriasis as a Diagnostic and Therapeutic Measure in General Disease," there appears advice so extraordinary from a therapeutic point of view that we feel called upon to comment thereon, lest the captivating style and specious claims of the author, evidently a specialist with no uncertain opinions as to the far-reaching evils attending ocular malfunction, lead to its general adoption by the general practitioner unacquainted with some of the dangers consequent thereon.

The author, proceeding upon the assumption that "there is an overwhelming mass of evidence to be found in medical literature leading to the conclusion that ametropia and muscular-imbalance may be the unsuspected cause of headache, sick headache, functional gastric and digestive derangement, anæmia, anorexia, chorea, convulsive tic, hysteria, and other nervous disorders," and that frequently improper correction by the ophthalmic specialist fails to remedy these disorders, brings forward a method of treatment which, to say the least, is highly ingenious, whereby the riddle as to questioned eye-strain may be ascertained by the "perplexed general physician" and the value of the oculist's previous manipulations settled. This remedy, so unhesitatingly and confidently recommended in pretty much all classes of affections in which eye-strain may be thought to be remotely an exciting cause, is none other than mydriasis by "homatropine (10 grains to the ounce) instilled three times a day, or atropine, if more prolonged mydriasis is not objectionable (4 grains to the ounce) in ordinary cases of those under fifty years of age."

Now, it would appear to us advice born of no little recklessness, this suggestion to the general practitioner as to the indiscriminate use of mydriatics, especially when it is considered how wide the latitude allowed their employment by a specialist whose convictions as to the variety of ailments which may be originated by eye-strain seem limitless; more especially, too, since such advice is totally unaccompanied by caution as to the direct and remote evils which might result from the too

free use of mydriatics, such, for instance, as atropine, which, suggested by the author, would most probably be selected by the physician who is without special training in eye-work, because of his greater familiarity with it as a drug and because of its representing to him the staple mydriatic of the ophthalmologist.

In the first place, it is questionable if prolonged mydriasis, even though slight, in cases of lingering illness, should be attempted by the general physician who is unaware of the following, which we quote from Lewin: "An observation of Von Graefe merits especial mention,—viz., that not infrequently there occurs, as a result of the continued use of collyria of atropine, symptoms which might be regarded as of erethistic debility and suspension of assimilation. This is a condition which it is difficult to distinguish and to assign to its true cause, owing to the absence of other symptoms of the action of atropine. An analogous condition to this is furnished by experiments which Rossbach and Von Anrep conducted on dogs. The animals became habituated to the drug, but also became emaciated, debilitated, and lost energy, spirits, and appetite. In spite, however, of the habituation, each new dose of the drug caused acceleration of the pulse and mydriasis."

It is also questionable if more serious harm in other directions may not result from the general employment of atropine, which is advised for use for prolonged mydriasis. There is one affection in which such continued mydriasis is thus particularly recommended, against which advice we must offer an especial protest. It is that alluded to under section third of the article as "a distinct and distressing gastric malady." The present writer has had a series of such cases under observation for several years, so that he is able to speak with some practical knowledge of the subject.

Now, while a therapy based upon rationalism is always desirable, for it to stand the test it must have as a substratum something other than narrow theoretic data. This so-called "distressing" malady, in which the use of atropine is advised (for prolonged mydriasis), is characterized by a condition in which there is persistent absence of the gastric secretory function, in all probability in most cases due to atrophy of the secreting structure of the stomach. For the maintenance of life the patient has to depend upon the digestive activity of the pancreatic secretion. The latter failing, profound cachexia is apt to result, leading early to a fatal issue. In the treatment of this condition it is of prime importance that efforts be directed to not only restore gastric secretion (until it is evident that atrophy of the tubules exist), but especially to maintain pancreatic activity. Now, it is well recognized that the physiological effects of atropine on the glandular system is to inhibit secretion, a small dose in almost every one producing such characteristic effects as dryness of the mouth, due to salivary arrest. Its action extends thus to the glandular system throughout the body, diminishing the secretion of the gastric follicles, but especially arresting that of the pancreas. In the writer, almost complete cessation of gastric digestion is produced by a moderate dose of the drug, and annoying gastric symptoms have occurred from a single instillation of atropine into the eye for the purpose of refraction. Indications of the same effect have often been noticed by the writer in others. As is well known, systemic physiological effects from the ocular instillation of atropine are common, and not rarely is serious disturbance so produced, due to absorption of that small quantity escaping through the tear-passages into the throat. With more or less prolonged use of atropine in the hands of the general physician, especially if instilled three times daily, over some time (as would appear, from the context of the sentence recommending it, is suggested), systemic effects could scarcely fail to occur in most cases; the result would inevitably be a tendency to the coincident arrest of pancreatic secretion, as of the salivary, the effects of which might be eventually more than temporary discomfort,—even actual disaster; all, too, without possible beneficial effect on the secretory function of the stomach which it had been hoped to reflexly influence. Secretory glands long the seat of inactivity and, most probably, of atrophy could not be expected, even after months of quiescence of supposed reflex irritant, to resume functioning, especially, too, when under the influence of a drug the effect of which is decidedly depressant to such activity.

The question now occurs, Is eye-strain really the frequent cause of this malady, as is claimed, so that such a remedy, if free from these objections, would be worthy of trial in these cases? Although no evidence which may properly be termed *overwhelming* exists in medical literature to indicate that ametropia and muscular-imbalance is the unsuspected cause of digestive derangement, it is not unlikely that eye-strain *may* be a contributing cause in certain cases of this special gastric affection. This may be conjectured from the association of the two conditions, pronounced ocular error, as in Dr. Stockton's cases, and aggravated

gastric disturbance, without other obvious cause than the former to originate the latter. But absolute *proof* of such a connection is altogether lacking, so that dogmatic assertion is as wholly unwarrantable as the curious therapy advised is improper. It seems to be pretty generally accepted by the well-informed that eye-strain, although a not infrequent source of many minor ailments in the susceptible, and occasionally of certain grave affections, cannot on authentic evidence be styled a frequent cause of any pronounced form of digestive derangement. Thus, Knies, in his recent work on the "Relations of Diseases of the Eye to General Disease," remarks that, "while there are manifold relations between diseases of the skin and eye, this is true to only a slight extent of diseases of the digestive organs, apart from a few very general occurrences."

The writer recently, in a paper read before the College of Physicians of Philadelphia,* particularly considered the facts of the supposed relation between refractive error and this especial affection, in which it is asserted by the author of the article criticised that eye-strain is a frequent cause, so he will not further consider it here. It is, however, now proper to state, in this connection, since the therapy advised was based solely on this supposed common association, that similar ocular errors exist without such gastric disease, and this peculiar condition of probable atrophy of the tubules with little or no eye-strain. In the cases studied by the writer he showed that refractive error of the kind mentioned was evident in one case only, and cited Einhorn's cases (the only others, so far as he knows, excluding Dr. Stockton's, in which eye examination had been made) as examples in which, with a similar gastric condition, the eyes were practically normal.

Enough, we think, has been said to indicate that mydriasis as a diagnostic and therapeutic measure in general disease must be employed with great caution, even by the ophthalmologist with previous training in general medicine; that the dangers consequent thereon may be sometimes of more moment and provocative of greater evil than a possible, merely suspected, refractive error, the influence of which, even when found to coexist in the production of the systemic malady, is often problematical. Certainly mydriatics, such as atropine, should only be employed thoughtfully by one fully alive to the physiological effects of the drug and their possible influence upon the systemic condition present. The indiscriminate use of a mydriatic by the general practitioner, when eye-strain has not first been ascertained to exist, cannot but be wrong.

Very truly yours,

D. D. STEWART.

PHILADELPHIA.

* To appear in the *American Journal of the Medical Sciences*.

LONDON.

(From our Special Correspondent.)

The best patronized clinic of the many open to visiting physicians is that of Mr. Jonathan Hutchinson. Many American physicians can be met there every Tuesday afternoon, busy examining the excellent drawings and photographs, and, at 4 P.M., listening to the most accomplished general practitioner in London and, possibly, of the world. Obscure cases of every variety are sent here from all parts of London to have their doubtful points elucidated by this man, who is a specialist in every department of medicine or surgery. A few notes gathered at his clinic I am sure will prove of interest. A case was shown of a man suffering from psoriasis, who had been taking from 5 to 7 minims of liquor arsenicalis for the past seven years, at the same time using a mild unguent of chrysophanic acid. The unguent alone would not check the eruption, but the arsenic always did, and Mr. Hutchinson stated that, in his experience, arsenic specifically and definitely holds psoriasis in control. This patient was never more than one month without taking arsenic, and now returned with characteristic disturbance of nutrition of skin, evidenced by a dry condition of the palms of the hands and soles of the feet. Arsenic will produce disturbed nutrition if no skin-disease is present, and we should always warn our patients that they may derange their health by a too prolonged use of the drug. The prodromal symptoms of excessive use of the drug are sweating of the palms of the hands and the soles of the feet, followed by general dryness of the skin. If the patient is not constantly under observation, we are to warn him to stop the drug if these symptoms are noticed.

Pemphigus has a prodromal symptom, almost pathognomonic, in persistent and recurring attacks of ulcers in the mouth. In pemphigus vegetans the drugs most beneficial are arsenic to keep down bullæ, and opium, preferably in Batley's solution, 3 to 5 drops, to completely prevent growth of the papillæ. In all forms of skin-disease where there are small sores at the angle of the mouth, Mr. Hutchinson considers opium in small doses is indicated. He believes that

liquor potassii arsenitis is much superior to liquor sodii arsenitis in all forms of skin-disease. Severe sores in the mouth accompanying pemphigus is an indication of the incurable nature of the disease.

Mr. Hutchinson believes that gonorrhœal rheumatism only occurs in those having a tendency to gout. Of foods, the flesh of birds is often the cause of gouty attacks; fruits should not be sweetened with cane-sugar. For treatment, where pain is great, he believes counter-irritation to be useful, applied as follows: after bathing the part in hot water, wrap in a flannel cloth soaked with tincture of capsicum and covered with oiled silk; leave on for half an hour if patient can bear it for that time; it will not vesicate, only redden. After removing irritant, pack the part with strong brine solution, wrapping all in oiled silk. In chronic arthritis the favorite prescription is aconite with potassium iodide.

In rodent ulcer Paquelin's cautery is superior to the acid nitrate of mercury or to nitric acid, its advantages being no pain after application and destruction is more thorough.

Mr. Hurry Fenwick has great faith in antipyrin (8 to 10 grains) in controlling renal pain, when not due to calculus; it always gives relief in tubercular disease of the bladder. Tubercular testes are treated on general principles only, but sometimes their removal is advised. In pain in the prostate he uses iodoform suppositories in the rectum, proceeding cautiously to increase the dose from 1 grain, but ceases the use of the drug if patient tastes it in the mouth. In cases characterized by frequency of urination, pain, and pus, where it is doubtful as to the condition being tuberculous or due to calculus, oil of santal should be used before resorting to sounding, as in tuberculous cases instrumentation often causes serious inflammation. Oleum santali in tubercle relieves cystitis in three or four days. Santal loses its power after using it for a year. Before passing the catheter in stricture when the patient is subject to rigor, he uses ½ drachm of twenty-per-cent. solution of cocaine hydrochlorate injected into deep urethra; it is an excellent preventive. [If this statement is correct, we believe it to be a very dangerous practice.—ED.]

At Gray's Inn Road Throat and Nose Hospital a routine practice in removing tonsils and adenoids is to order mistura hydrargyri biniodidi for one week preceding removal, and after removal to wash out the throat and nose with solution of Condy's fluid, and order 5 grains of sodium salicylate t. d. for one week following operation.

A BAD PRESCRIPTION.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—An infant, five months old, was recently brought to my clinic at the Philadelphia Polyclinic, suffering from enteritis. The parents, who accompanied the child, presented a bottle containing a grayish liquid of an excessively foul and noxious odor. They stated that this was medicine which had been prescribed for the child by a physician. Taking the number of the prescription from the bottle, I wrote to the pharmacist who filled the prescription, asking him to kindly inform me what the mixture contained. It was evident that the excessive heat—as the patient came during the recent heated term—had caused the contents of the bottle to decompose. Through the courtesy of the pharmacist, Mr. E. Lupin, Sixth and Lombard Streets, I am enabled to give the prescription, which is as follows:

> Papoid, gr. xlviii;
> Pancreatin, ʒi;
> Sodium bicarbonate, ʒiss;
> Sugar,
> Powdered acacia, of each, ʒiss;
> Water sufficient to make ℥iii.
> Dose.—1 teaspoonful after feeding.

I present this to the GAZETTE as an instance of the danger of prescribing a fermentable mixture during hot weather.

Very truly yours,

EDWARD P. DAVIS, M.D.,

Professor of Obstetrics and Diseases of Infancy, Philadelphia Polyclinic.

INTESTINAL COAPTATION.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—The *accurate coaptation* of a divided "intestine" is sometimes a difficult thing to do. The writer would suggest to his professional brethren, who may have to do this operation, that they use half-cooked "biscuit dough" made into a roll of a suitable size, wrapped around the middle with antiseptic catgut. This can be readily slipped into the divided "intestine," and the *suturing—Lembert or continuous*—will be a very simple thing to do. The roll of dough is not a foreign body, and can be slipped in any direction away from the wound.

Hoping this suggestion may be of some benefit to the profession, I am,

Very respectfully,

M. L. JAMESON, M.D.

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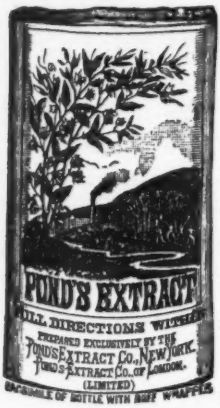

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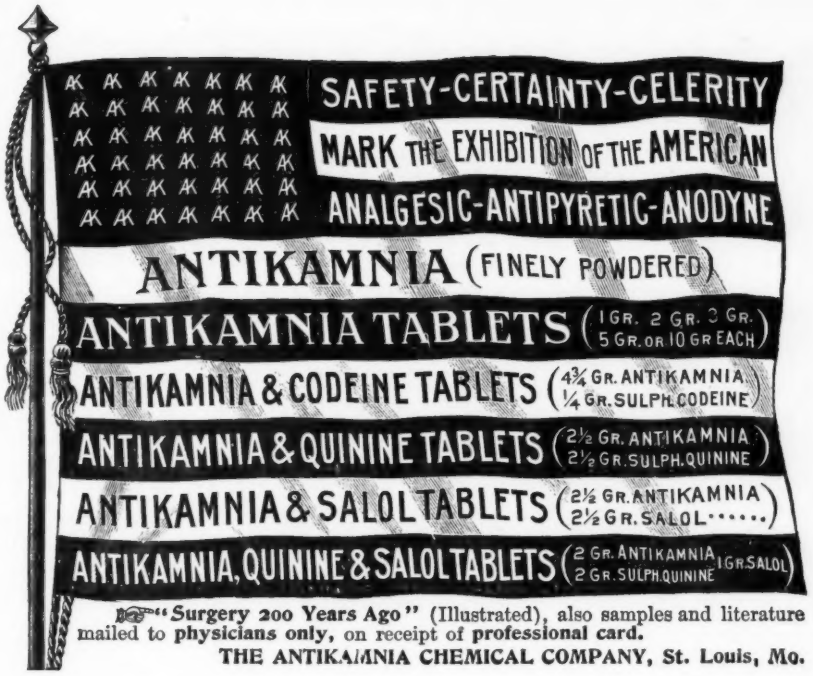
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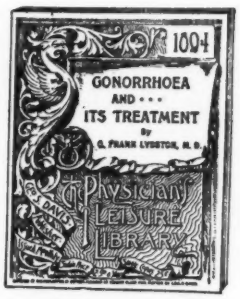

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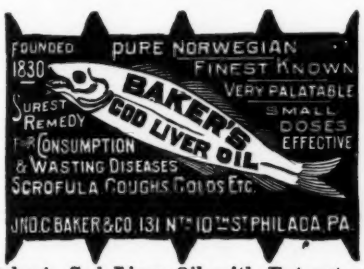

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